



**Indiana Vocational  
Technical College  
1984-85 Catalog**



# **Indiana Vocational Technical College**

## **1984 - 1985 Catalog**

The education programs, courses, descriptions of courses, regulations, and fees shown in this catalog are effective Fall Quarter 1984. This publication and its provisions are not in any way a contract between the student and Indiana Vocational Technical College. The College reserves the right to revise any section or requirement at any time.

### **Nondiscrimination Policy-Equal Opportunity/Affirmative Action Program**

The Indiana Vocational Technical College will seek to develop degree credit programs, courses, and community service offerings, and provide for open admission counseling and placement service for all individuals regardless of race, color, creed, religion, sex, national origin, physical or mental handicap, age or veteran's status. Furthermore, the College will intensify its concern and elevate its professional competence to the elimination of the conditions from which discrimination springs.

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## COLLEGE CALENDAR 1984-85

### SUMMER 1984

May 21  
May 28  
July 4  
August 7

Classes Begin  
Memorial Day  
Independence Day  
Classes End

### FALL 1984

August 28  
September 3  
November 13

Classes Begin  
Labor Day  
Classes End

### WINTER 1984-85

November 20  
November 22-23  
December 19 - January 1, 1985  
February 20

Classes Begin  
Thanksgiving Holiday  
Winter Break  
Classes End

### SPRING 1985

February 27  
May 14

Classes Begin  
Classes End

## COLLEGE CALENDAR 1985-86

### SUMMER 1985

May 21  
May 27  
July 4  
August 7

Classes Begin  
Memorial Day  
Independence Day  
Classes End

### FALL 1985

August 28  
September 2  
November 13

Classes Begin  
Labor Day  
Classes End

### WINTER 1985-86

November 20  
November 28-29  
December 17 - January 1, 1986  
February 24

Classes Begin  
Thanksgiving Holiday  
Winter Break  
Classes End

### SPRING 1986

March 3  
May 16

Classes Begin  
Classes End





## MESSAGE FROM THE PRESIDENT

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Indiana Vocational Technical College is an exciting, growing institution! Although only twenty-one years old, the College currently enrolls more than 27,000 men and women who choose to improve their job skills and employment potential through practical training at the College. Courses and programs of study are offered in trade and technical areas, business sciences, graphics and media work, and health occupations.

Ivy Tech, as we're popularly known, is the only Indiana college or university legislatively mandated to provide statewide post-secondary vocational technical education. The College understands and is proud of this mission "to match job opportunities with job skills."

Ivy Tech utilizes a network educational delivery system by offering classes through 13 regional centers throughout Indiana. Within each of these regional areas, instruction is offered at many convenient sites during the day and evening so that students may attend more easily.

The variety in Ivy Tech's instructional programming encourages individuals to retrain or upgrade skills and provides for in-service development opportunities. The College's continuing instructional emphasis on new or expanding industrial and business equipment and processes helps provide the Ivy Tech student with the skills demanded today in the "real world" of work in Indiana.

As you examine this catalog, we invite you to share our pride and enthusiasm about the educational offerings and student services available at Ivy Tech. Please contact the Ivy Tech regional center closest to you for additional information. The centers are listed on page 6.

Gerald I. Lamkin, President

## REGIONAL ADMINISTRATIVE CENTERS

### **IVY TECH GARY, Region 1**

1440 East 35th Avenue  
Gary, Indiana 46409  
Phone 219/981-1111

### **IVY TECH SOUTH BEND, Region 2**

1534 West Sample Street  
South Bend, Indiana 46619  
Phone 219/289-7001

8-746-

### **IVY TECH FORT WAYNE, Region 3**

3800 North Anthony Boulevard  
Fort Wayne, Indiana 46805  
Phone 219/482-9171

### **IVY TECH LAFAYETTE, Region 4**

3208 Ross Road  
P.O. Box 6299  
Lafayette, Indiana 47903  
Phone 317/477-7401

### **IVY TECH KOKOMO, Region 5**

1815 East Morgan Street  
Kokomo, Indiana 46901  
Phone 317/459-0561

### **IVY TECH MUNCIE, Region 6**

4100 Cowan Road P.O. Box 3100  
Muncie, Indiana 47302  
Phone 317/289-2291

### **IVY TECH TERRE HAUTE, Region 7**

7377 S. Dixie Bee Road  
Terre Haute, Indiana 47802  
Phone 812/299-1121

### **IVY TECH INDIANAPOLIS, Region 8**

One West 26th Street  
P.O. Box 1763  
Indianapolis, Indiana 46206  
Phone 317/929-4882

### **IVY TECH RICHMOND, Region 9**

2325 Chester Boulevard  
Richmond, Indiana 47374  
Phone 317/966-2656

### **IVY TECH COLUMBUS, Region 10**

4475 Central Avenue  
Columbus, Indiana 47203  
Phone 812/372-9925

### **IVY TECH MADISON, Region 11**

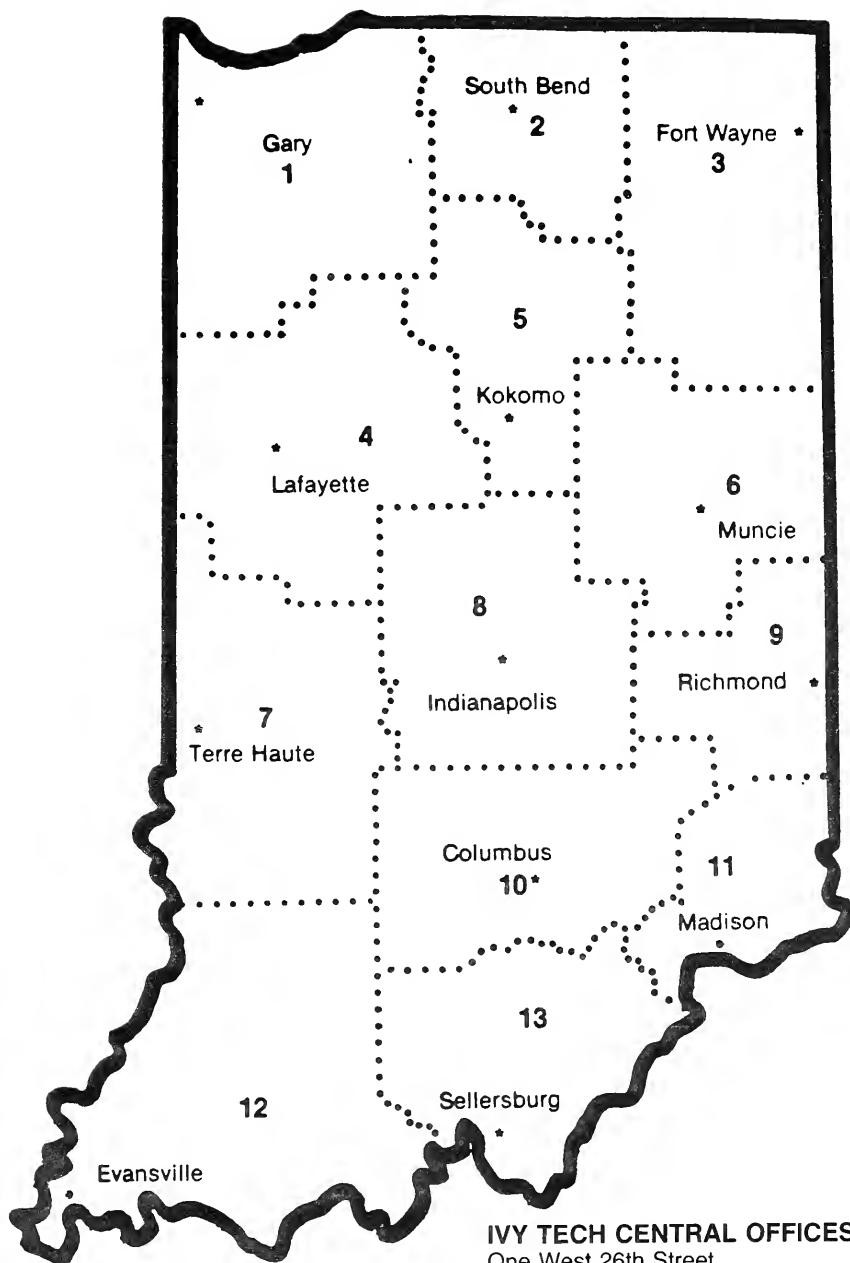
Ivy Tech Drive  
Madison, Indiana 47250  
Phone 812/265-2580

### **IVY TECH EVANSVILLE, Region 12**

3501 First Avenue  
Evansville, Indiana 47110  
Phone 812/426-2865

### **IVY TECH SELLERSBURG, Region 13**

8204 Highway 311  
Sellersburg, Indiana 47172  
Phone 812/246-3301



**IVY TECH CENTRAL OFFICES**  
One West 26th Street  
P.O. Box 1763  
Indianapolis, Indiana 46206  
Phone 317/929-4882

# STATE BOARD OF TRUSTEES

---

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International Brotherhood of Electrical Workers-Local 697; 2835 165th Street, Box 2189, Hammond, IN 46323.

Wendell D. Vandivier

Coordinator, Carpenters' Joint Apprenticeship Committee of Central and Western Indiana; 1836 Barth Avenue, Indianapolis, IN 46203.

Mrs. Philip T. Warner

17607 State Road 4, Goshen, IN 46526.

August 1984

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---

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 Steven A. Fellows  
 Mary Lou Heinz  
 James Kimbell  
 Lincoln A. Taylor

# COLLEGE ADMINISTRATIVE OFFICERS

---

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President  
College Central Offices

John T. Hatchett  
Vice President/Treasurer  
College Central Offices

Dr. Norman W. Sievert  
Vice President/Educational Services  
College Central Offices

Mearle R. Donica  
Vice President/Dean  
Region 1 - Northwest

Samuel E. Borden  
Vice President/Dean  
Region 7 - Wabash Valley

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Vice President/Dean  
Region 2 - Northcentral

Dr. Meredith L. Carter  
Vice President/Dean  
Region 8 - Central Indiana

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Vice President/Dean  
Region 3 - Northeast

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Vice President/Dean  
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Region 4 - Lafayette

Harvey S. Poling  
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Region 10 - Columbus

(Vacant)  
Vice President/Dean  
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Richard L. Davidson  
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Region 6 - Eastcentral

Dr. H. Victor Baldi  
Vice President/Dean  
Region 12 - Southwest

Carl F. Scott  
Vice President/Dean  
Region 13 - Southcentral

# COLLEGE PROFILE

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## HISTORY OF THE COLLEGE

Indiana Vocational Technical College, popularly known as Ivy Tech, was established in 1963 by the Indiana General Assembly as Indiana's first statewide vocational-technical college. The legislature appropriated at that time \$50,000 for development of the College. Following appointment of a State Board of Trustees, a director was named and the first training program established in 1965. Later amendments to the enabling legislation authorized Ivy Tech's present regional structure of thirteen administrative centers, designed to provide easily accessible technical training to all citizens of Indiana. Between 1966 and 1969 thirteen regional boards of trustees were appointed and thirteen regions chartered.

The College has shown impressive growth in the relatively short period of its existence. Enrollment increased from 3,233 students in the fall quarter of 1968 to 27,862 in the same period of 1983. Operating budgets have also increased during these years. In 1965 the General Assembly appropriated \$2,800,000 for Ivy Tech's first operating budget; in 1983-84 it appropriated \$26 million as part of Ivy Tech's total operating budget of \$44 million.

## MISSION OF THE COLLEGE

The mission of Ivy Tech is stated in the authorizing legislation: "There shall be, and hereby is created and established, a new state post-high school educational institution to be devoted primarily to



occupational training of a practical, technical, and semitechnical nature for the citizens of Indiana.”

The law also challenges Ivy Tech to serve, *without regard to prior education*, Indiana citizens desiring vocational-technical training. Five target population groups are identified:

- (1) students who have not graduated from high school;
- (2) high school graduates interested in continuing their education in a vocational-technical type institution with programs of shorter duration than a four-year college program;
- (3) students who have not completed college work;
- (4) college graduates interested in supplementing their education with vocational-technical training; and
- (5) adults needing and desiring retraining or additional training in a vocational-technical specialty.

Ivy Tech's mission was broadened in 1971 with the added authority to grant diplomas or appropriate certificates of achievement, including the one-year Technical Certificate and the two-year Associate in Applied Science degree to students completing prescribed and authorized courses or series of courses. Furthermore, the College was not prohibited from offering academic courses if, in its opinion, such courses are in demand and needed for the vocational-technical education of the people in the region.

## GOALS OF THE COLLEGE

Ivy Tech adheres to the belief that each individual, regardless of economic or social status, should be provided opportunities to obtain relevant, occupation-oriented education and training. The opportunities should be, to the fullest extent possible, free of constraints posed by previous educational experiences or geographic location. General and technical classes are combined to develop self-awareness and to prepare students to compete successfully in chosen occupations. Accordingly, Ivy Tech has established the following goals:

1. The College will offer occupation-oriented continuing education and training consistent with the economic development needs of interested groups in the State of Indiana.
2. The College will offer a wide range of meaningful occupation-oriented programs with multiple entry and exit opportunities in a continuum of education and training consistent with the individual student's interests, needs, and abilities.
3. The College will strive to provide the opportunity for citizens of the state to enroll in the College regardless of their finan-

cial resources, previous educational experiences, or geographic location.

4. The College will provide the opportunity for each applicant to gain occupational competence regardless of age, race, sex, or religious affiliation.
5. The College will encourage understanding, acceptance, and support for occupation-based education and training throughout the state of Indiana and will communicate the valuable contribution it makes to the individual, community, state, and nation.
6. The College will provide educational and training experiences supportive of the individual student's social, cultural, and personal development within each occupational program offering.
7. The College will use its resources prudently to implement its legislature-mandated mission.
8. The College will cooperate with other providers of occupation-oriented training and education in all educational sectors.
9. The College will continue to develop a dynamic occupation-based delivery system capable of adapting its offerings to the changing technological and socioeconomic needs of the community, state, and nation.
10. The College will offer relevant, occupation-oriented, post-secondary education and training to develop students to the desired level of competence consistent with the manpower needs of the state of Indiana.

Steadfast adherence to its mission and goals, together with strong support and encouragement from state and community leaders, have made possible Ivy Tech's outstanding achievements in a relatively short period.

## **FACULTY**

In fall 1983 the College employed 444 full-time and 1,289 part-time faculty. The faculty members usually have extensive practical work experience in their fields of instruction. Most part-time instructors are regularly employed in their fields and many of the full-time instructors remain active in their professions. Some of the faculty members are authors of textbooks on their specialties.

Instructors who are active in their fields are able to bring to the Ivy Tech classroom and laboratory their knowledge of current technology, methods, and techniques. The use of a large part-time faculty

allows the College greater flexibility in scheduling classes in daytime, evening, and weekend hours.

## FACILITIES

Many types of facilities are used as instructional sites. Each of the thirteen regions of the College has at least one major regional center. Classes are offered throughout the state in more than 160 buildings, of which the College owns 46.

## ACCREDITATIONS AND MEMBERSHIPS

Indiana Vocational Technical College is accredited by the North Central Association of Colleges and Secondary Schools, the State Board of Vocational Technical Education, and other agencies as listed below by region. The College is a member of the American Association of Collegiate Registrars and Admissions Officers, the American Association of Community and Junior Colleges, the Association of Community College Trustees, and the National Association of Collegiate and University Business Officers.

### Accrediting Agencies

Region	Agency	Program Area
1	Northwest Indiana Chef's Association	Culinary Arts
	The American Culinary Federation Inc.	Culinary Arts
	U.S. Department of Labor	Culinary Arts
	Joint Review Committee on Respiratory Therapy Education	Respiratory Therapy Technician
	Joint Review Committee on Education for the Surgical Technologist	Surgical Technician
	American Assn. of Medical Assistants	Medical Assistant
	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing
	State Board of Vocational and Technical Education	All
2	North Central Association of Colleges and Schools	All
	State Board of Vocational and Technical Education	All
	American Assn. of Medical Assistants	Medical Assistant
	National Accrediting Agency for Clinical Laboratory Sciences	Medical Lab Technician
	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing

3	<p>American Assn. of Medical Assistants Hospital, Institution, and Educational Food Service Society Joint Review Committee for Respiratory Therapy Education Indiana State Board of Nurses' Registration and Nursing Education State Board of Vocational and Technical Education</p>	<p>Medical Assistant Dietary Assistant  Respiratory Therapy Technician Practical Nursing  All</p>
4	<p>State Board of Vocational and Technical Education North Central Association of Colleges and Schools Indiana State Board of Nurses' Registration and Nursing Education National Accrediting Agency for Clinical Laboratory Sciences American Assn. of Medical Assistants Association of Surgical Technologists Joint Review Committee on Respiratory Therapy American Dental Association</p>	<p>All  All  Practical Nursing  Medical Lab Technician  Medical Assistant Surgical Technician Respiratory Therapy Technician Dental Assistant</p>
5	<p>American Assn. of Medical Assistants State Board of Vocational and Technical Education North Central Association of Colleges and Schools</p>	<p>Medical Assistant All  All</p>
6	<p>North Central Association of Colleges and Schools State Board of Vocational and Technical Education American Assn. of Medical Assistants Council for Standards and Human Services  Indiana State Board of Nurses' Registration and Nursing Education</p>	<p>All  All  Medical Assistant Mental Health Rehabilitation Practical Nursing</p>
7	<p>North Central Association of Colleges and Schools National Accrediting Agency for Clinical Laboratory Sciences, Committee on Allied Health Education and Accreditation American Society of Radiologic Technologists Indiana State Board of Nurses' Registration and Nursing Education American Assn. of Medical Assistants State Board of Vocational and Technical Education</p>	<p>All  Medical Lab Technician  Radiologic Technology Practical Nursing  Medical Assistant All</p>

8	North Central Association of Colleges and Schools	All
	National Accrediting Agency for Clinical Laboratory Sciences	Medical Lab Technician
	American Assn. of Medical Assistants	Medical Assistant
	Assn. of Surgical Technologists, Inc.	Surgical Technician
	American Society of Radiologic Technologists	Radiologic Technology
	Joint Review Committee on Respiratory Therapy Education	Respiratory Therapy Technician
	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing
9	National League of Nursing	Practical Nursing
	State Board of Vocational and Technical Education	All
	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing
	National Accrediting Agency for Clinical Laboratory Sciences	Medical Lab Technician
	Emergency Medical Services Commission	Emergency Medical Technician
	Indiana State Board of Health	Home Health Aides
	North Central Association of Colleges and Schools	All
10	State Board of Vocational and Technical Education	All
	North Central Association of Colleges and Schools	All
	Joint Review Committee on Respiratory Therapy Education	Respiratory Therapy Technician
	State Board of Vocational and Technical Education	All
11	North Central Association of Colleges and Schools	All
	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing
	American Assn. of Medical Assistants	Medical Assistant
	State Board of Vocational and Technical Education	All
12	American Assn. of Medical Assistants	Medical Assistant
	State Board of Vocational and Technical Education	All
	North Central Association of Colleges and Schools	All
13	Indiana State Board of Nurses' Registration and Nursing Education	Practical Nursing
	American Assn. of Medical Assistants	Medical Assistant

North Central Association of Colleges and Schools	All
State Board of Vocational and Technical Education	All

# IVY TECH FOUNDATION

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The Ivy Tech Foundation is a nonprofit, tax-exempt organization, dedicated to serving the purposes and functions of Indiana Vocational Technical College. The Foundation, which operates solely for the benefit of the College, promotes educational, scientific, and charitable functions in connection with or at the request of the College.

The Foundation, incorporated in 1969, has contributed greatly to the statewide growth and development of the College. It was instrumental in providing property and facilities for the initial development of many of the regional institutes and it continues to devote its resources to the improvement and enrichment of the College facilities, instruction, and services. The Foundation also offers service to Ivy Tech students directly through its scholarship and loan programs.

The Foundation receives and administers gifts, grants, bequests, equipment donations, contracts, and patents on behalf of the College.

# STUDENT SERVICES

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## ADMISSIONS

### General Admissions

It is the policy of Indiana Vocational Technical College to provide open admission for citizens of the State of Indiana. The College provides for admission of any person regardless of race, color, creed, national origin, sex, age, or handicap. Citizens of other states may be admitted under the same policy provided they do not displace an Indiana citizen. The open admission policy grants access to all persons above the usual high school age and to those who have withdrawn from high school.

To be admitted to the College, students must be at least sixteen years old and meet one of the following criteria:

1. high school graduation;
2. successful completion of a high school equivalency examination;
3. a demonstrated interest in and need for post-secondary occupational education as offered by the College.

For admission to the College, the applicant should accomplish the following:

1. Complete an application for admission to the College.
2. Submit the application for admission to the Office of Student Services of the chosen regional institute.



3. Provide an official high school transcript, GED Certificate, and/or post-secondary transcript. Official transcripts must originate from the institution previously attended.
4. Submit as a part of the program admission process, when required by the selected program, a complete health examination form signed by a medical doctor.

The College reserves the right to guide the enrollment of students in a particular program or course on the basis of their prior academic records, vocational counseling, and testing.

A student who leaves the College may later request reenrollment. The student whose course of study at Ivy Tech has been interrupted should notify the Student Services Office in advance of registration.

### **Limited Admission and Enrollment**

The number of students admitted and enrolled in programs and/or courses may be limited by one or more of the following factors:

1. College financial resources;
2. facilities, including available lab equipment and related support;
3. the number of available health program clinical work stations.

Some programs have prerequisites or entrance requirements based on skill levels and prior knowledge. Selected programs may require a completed health examination form signed by a medical doctor.

### **Admission Support Documents\***

1. The College requests all students to complete the Student Admission Data form, which establishes their records in the admissions office.
2. The College requests the high school graduate/GED completer to forward an official copy of the transcript to the admissions office.
3. The College may request the student to talk with a College counselor, who will assist in selecting a course of study that will be of maximum benefit.
4. To transfer credits to Ivy Tech from another college or similar post-secondary institution previously attended, the student is requested to forward an official copy of the grade transcript or other document from that institution to Ivy Tech.
5. The College requires a health examination for certain health occupations.

\*Students currently attending high school may attend Ivy Tech with the written permission of an official of the high school.

## **Transfer Students**

Students admitted from other recognized colleges and universities may be awarded credit at Ivy Tech for completed courses that apply to the chosen program of study. These students must present an official transcript from the institution previously attended and meet general admission requirements. The College reserves the right to refuse admission or to accept conditionally those students who have been dismissed for disciplinary reasons from other colleges or universities, including other regions of Ivy Tech.

## **International Students**

Ivy Tech admits qualified students from other countries. International students must meet College admission requirements and specific procedural requirements for international applicants. They must also provide proof of adequate financial support. It is estimated that the international student will need a minimum of \$8,500 per year (1983-84) for fees and living expenses while attending the College. The international student should submit a letter from an appropriate sponsor, government official, or bank official stating that sufficient funds are available to cover the cost of the student's education and that these funds will be available to the student while attending college in this country. The Office of Student Services will provide additional information and assistance upon request.

## **Handicapped Students**

College programs and facilities are accessible to the student with physical handicaps. Designated parking and special restroom facilities are available at each regional institute. Support services are also available to aid handicapped students with career planning, financial aid, personal counseling, and placement. The College staff works with the Department of Vocational Rehabilitation and other service agencies to assist physically and psychologically impaired students through available local community resources.

Students with handicaps are urged to contact the Student Services Office for help with their special problems as students at Ivy Tech.

## **STUDENT ORIENTATION**

All new students are encouraged to participate in an orientation program prior to or during the first week of classes. The purpose of the orientation is to assist students in making the transition to the College environment. Topics discussed include student services, financial aids, business services, instructional programs, College activities, and College policies and procedures. The orientation program may also include, if not yet completed, testing, interviews, evaluations, counseling, program advising, determination of advanced standing status, and scheduling of classes.

## **CAREER COUNSELING**

The Office of Student Services in each region offers counseling to all interested students. Students may obtain individual counseling and/or assessment to assist them in identifying their abilities or occupational interests or in developing realistic educational or career plans and occupational outlook data. A computerized career guidance system (TEDS) has been installed in each Office of Student Services. Students wishing assistance in selecting an occupation and the necessary training may contact Student Services.

A faculty advisor system complements the counseling program provided by the Office of Student Services. Each student, on admission to the College, is assigned a faculty advisor, whose purpose is:

1. to assist the student in course selection and program planning;
2. to guide the student in meeting the requirements for graduation as prescribed by the College;
3. to insure that appropriate technical and general education electives are included in the chosen course of study.

The College encourages close cooperation among students, faculty, and staff. Some counseling is available on an unscheduled basis; however, students are encouraged to schedule appointments with counselors in advance at the Office of Student Services.

## **Assessment Testing/Services**

All students should attend an assessment session before being admitted into a program. These assessments are not used for College admission purposes; they are used to assist in determining program and course choices of maximum benefit to the student. Ivy Tech offers a variety of assessments to assist students with career planning and program placement. Students can also receive help in

career selection through counseling and testing. Career testing is used only for student guidance, not for admission selection. Adults who have been out of school for some time are encouraged to complete the testing program to assist them in determining their career goals and planning their course of study. A fee may be charged to cover the cost of administering some of the tests and assessments. Students with previous college credits should submit an official college transcript, which may be used in lieu of testing.

## **Test-out Procedures**

The policy regarding testing out of classes varies from program to program; therefore, a student wishing to test out of a class should contact the program advisor before registering for the class. A fee may be charged for test-outs.

The general guidelines for test-out are as follows:

1. Test-out examinations should be taken before registering for the class for which the test-out is attempted.
2. Test-out examinations should be taken and completed at one sitting (unless the test is offered in two parts, i.e., lab and written exams).
3. Test-out examinations for specific courses should be attempted only once.
4. Test-out credits may not be included in credit computations for financial aid programs.

## **REGISTRATION**

The registration process includes program counseling, selection of classes, and payment of fees. Newly admitted students will be notified as to when to register for their first quarter classes.

Specified days are set aside prior to each quarter for registration. Students are advised to seek assistance in course selection from faculty advisors or counselors in the Office of Student Services prior to registering for classes.

Please contact the Student Service Office of the Ivy Tech region you wish to attend for information concerning registration procedures.

**NOTE: STUDENTS ARE NOT REGISTERED UNTIL FEES HAVE BEEN PAID**

## Late Registration

Registration is considered late if submitted on or after the first day of classes each quarter. Late registration is permitted during the first week of classes with the permission of the instructor. A \$10 late registration fee is assessed. After the first week of classes registrations will be processed only with the appropriate approval.

## Drop-and-Add

Courses may be dropped or added without advisor approval during the first week of classes. During the second and third weeks of classes courses may be dropped or added only with advisor approval and proper signatures on the forms. The student is not officially dropped from the class until the necessary forms are completed and returned to the Office of Student Services. (For further information, see refunds, grades, and status.)

## Withdrawal Procedure

Withdrawal is defined as the act whereby a student officially files a withdrawal form and discontinues course attendance. To be considered officially withdrawn from a course, the student must file a withdrawal form with the Student Services Office. TERMINATION OF CLASS ATTENDANCE DOES NOT CONSTITUTE AN OFFICIAL WITHDRAWAL.

## Enrollment Status

Registration dates are publicized well in advance of each new quarter. The following designations are used to determine a student's enrollment status:

Full-time student	12 or more credits per quarter		
3/4 time	9-11 credits	"	"
1/2 time	6-8 credits	"	"
Less than 1/2 time	1-5 credits	"	"

A first-year student, by definition, is one who has completed up to 45 program specific credit hours; a second-year student is one who has completed 46 or more program-specific credit hours.

## COLLEGE FEES

The College seeks to provide quality training at the lowest possible cost. General fees are based on the number of credit hours carried. Additional costs include divisional fees and special fees pertaining to particular courses or College activities.

For 1984-85, an in-state student attending full-time (taking 15 credit hours) was charged approximately \$342 for general fees. General fees do not include special fees, books, travel, or living expenses. Tuition and fees are subject to change by the Indiana Vocational Technical College State Board of Trustees.

### **Schedule of Fees (as of 5-1-84)**

(Subject to change without prior notice)

#### **General Fee**

Indiana Residents	\$22.75 per credit hour
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#### **Tuition**

Out-of-State Students	\$42.50 per credit hour
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#### **Divisional Fees**

Business Science Division	\$ 1.25 per credit hour
Graphics and Media Division	\$ 4.25 per credit hour
Trade/Technical Division	\$ 2.00 per credit hour
Health Occupations Division	\$ 1.25 per credit hour

#### **Student Activity Fee**

The Student Activity fee varies by enrollment status and region.

<b>Late Registration Fee</b>	<b>\$10.00</b>
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A schedule of current fees is available at any Ivy Tech regional center.

### **Additional Expenses**

The following additional expenses may apply, depending upon the program of study:

**BOOKS:** All students are expected to purchase the textbooks for their respective programs. The cost of books will average about \$20 per course.

**TOOLS:** The College furnishes major equipment items for instruction; however, in many programs or courses students must furnish additional hand tools and equipment.

**UNIFORMS AND OTHER SPECIAL EQUIPMENT:** Several programs require students to furnish uniforms and special safety clothing.

**ROOM AND BOARD:** Since Ivy Tech is not a residential college, room and board fees are not included.

**TRAVEL:** Transportation costs to and from the College vary according to the distance and the type of transportation used.

For further information, contact the Office of Student Services.

## **Payment of Fees**

All enrolled students must make arrangements at the time of registration to pay all applicable fees. A STUDENT IS NOT OFFICIALLY REGISTERED AND IS NOT ALLOWED TO ATTEND CLASSES UNTIL FEES HAVE BEEN SATISFIED.

## **Refund Policy**

Students choosing to withdraw from a course or courses must notify the College in writing (i.e., the Drop/Add form).

The College will refund students' assessed fees on a schedule computed from the date of the submission of drop/add forms or College withdrawal forms, as follows:

Registration through the first week	100% refund
Second week	50% refund
Third week	25% refund
After third week	No refund

Cancellation of credit courses by the College will result in total refund of fees collected for those courses.

Fee remission for voluntary withdrawal from a class will be processed after the student files a College drop/add form or withdrawal form with the Student Services Office.

Students should allow approximately four to six weeks for processing of refund checks. All refunds will be issued by check and mailed to the address shown on the student registration form.

## **Non-refundable Fees**

Certain fees may not be refundable.

## **FINANCIAL AID**

Indiana Vocational Technical College offers various types of financial aid to students who need assistance to continue their education. Some aid programs are administered by the College Financial Aid Office under the policies and guidelines established by the state and federal governments; other programs are administered directly by a state or federal agency or an outside organization. Eligibility for most financial aid at Ivy Tech is based upon the student's demonstrated financial need. The student must complete either the Financial Aid Form (FAF) or the Application for Federal Student Aid (AFSA) each year. In addition, the student must also:

1. be a citizen, national, or permanent resident of the United States;
2. be accepted for admission to the College in an eligible program on at least a half-time basis;
3. file an Ivy Tech application for financial aid annually;
4. submit documentation to verify the data provided on the FAF or AFSA;
5. maintain satisfactory academic progress;
6. sign draft compliance and educational purpose statements.
7. indicate acceptance of any award by signing the appropriate Student Aid Report or award letter within deadlines specified by the regional Financial Aid Office.

## **Grants and Scholarships**

### ***Pell Grants***

Pell Grants represent the largest federal student assistance program. The College requires all students seeking aid to apply for a Pell Grant. This is accomplished by filing the Application for Federal Student Aid (AFSA) or the Financial Aid Form (FAF). Since the amount of the grant is based on the student's need, enrollment status, and cost of education at Ivy Tech, it may vary from quarter to quarter. The Pell Grant applicant will receive a copy of the Student Aid Report (SAR), which must be presented to the Financial Aid Office prior to or during the time the student is enrolled to determine the amount of the grant.



### ***Supplemental Educational Opportunity Grant (SEOG)***

The SEOG is a federally funded student aid program. Applicants must file the Application for Federal Student Aid or the Financial Aid Form to establish eligibility. Since the amount of SEOG funds allocated to the College by the Federal government varies each year, students with high financial need will receive priority for the limited funds.

### ***Hoosier Scholarships***

The State Student Assistance Commission of Indiana (SSACI) may award from one to three scholarships per high school, based on the size of the graduating class. Candidates are nominated by their high schools. The Hoosier Scholarship is a one-time, nonrenewable merit award in the amount of \$500 for one academic year.

### ***Higher Education Awards (HEA)***

Residents of Indiana may apply for Higher Education Awards (formerly called state grants). Applicants must file the financial aid form (FAF) by March 1, preceding their enrollment for the following fall quarter. Awards are based on demonstrated need. Recipients of Higher Education Awards must be enrolled full-time each quarter to use them.

### ***Ivy Tech Scholarships***

Many of the regional institutes award scholarships provided by local civic and service organizations. Students are advised to contact the Financial Aid Coordinator for details concerning available scholarships.

### ***Discretionary Fee Remission***

Each region is authorized to grant limited fee remissions at the time of enrollment to students with special needs arising from unusual circumstances. The fee remission may not exceed the general fee.

## **Employment and Loans**

### ***College Work-Study Program (CWS)***

The federally funded college work-study program provides part-time employment to students who need financial assistance. The student is required to submit the Application for Federal Student Aid

(AFSA) or the Financial Aid Form (FAF). The job assignments may be within the College or in public nonprofit agencies in the community. Students are assigned jobs by the Financial Aid Coordinator, who takes into consideration the amount of the student's need, the student's class schedule, and the student's family or personal obligations. The starting hourly rate is at least the federal minimum wage. Employment may consist of, but is not limited to, secretarial and clerical office work, maintenance or custodial work, duties in the Learning Resource Center (LRC), or work as lab assistants. Where possible, students are offered work-study assignments in areas related to their career objectives.

### ***Indiana Guaranteed Student Loan Program (GSL)***

Students who attend at least half-time may borrow up to \$2,500 per year from private lenders, such as commercial banks, savings and loan associations, or credit unions. The interest rate of a GSL, determined by congressional action at the time of the student's first application for the loan, may be either 7%, 8%, or 9%. The federal government pays the interest on the loan during the time the student is in school, provided the borrower has met certain criteria set by the federal government for the interest subsidy.

Repayment begins six months after the student graduates or ceases at least half-time attendance. Applications for an Indiana Guaranteed Student Loan may be obtained from Ivy Tech financial aid offices or from a hometown bank, savings and loan association, or credit union. The Financial Aid Coordinator must complete a portion of the loan application and approve it before it can be returned to the lender for processing.

### ***Ivy Tech Foundation Loans***

An emergency loan fund is available to students in need of small loans on a short-term basis. The loan must be repaid within 30-60 days. Information concerning this interest-free emergency loan fund is available from the Financial Aid Coordinator.

### ***Veterans' Benefits***

Students who served in the armed forces may be eligible for veterans' benefits. The Veterans Administration determines eligibility for all veterans. Eligible recipients of veterans' benefits are entitled to 1½ months of educational assistance for each month of active duty after January 31, 1955, up to a maximum of 45 months.

The amount of monthly educational allowance is based on the

number of dependents and the training time. For Associate Degree students, training time is based on the number of credits taken; for Certificate students, training time depends on the number of contact hours per week.

Applications for educational benefits may be obtained from the Ivy Tech regional Office of Veterans Affairs. The student should apply for these benefits at the regional institute of his/her choice at the earliest possible date. The College is responsible for reporting the attendance of veterans and certifying that they are making reasonable progress toward an educational objective. Each regional campus of Ivy Tech has a person designated as Veterans Affairs Coordinator to handle the reporting duties and assistance to veterans.

Children of veterans who are deceased or 100% disabled as a result of service connected injury may be eligible for veterans' benefits and should contact the Ivy Tech regional Veterans Affairs Coordinator to apply for benefits.

Indiana residents who are children of deceased or disabled veterans or of veterans who are recipients of the Purple Heart may be eligible for a fee waiver at Ivy Tech if the parent's death or disability or receipt of the Purple Heart occurred as a result of military service during wartime. Inquiry concerning this benefit may be made at the Ivy Tech regional Office of Veterans Affairs or Financial Aid Office.

### ***Social Security***

Social Security benefits for post-secondary students are being phased out over a three-year period, which began in July 1982 and which will end in April 1985. Only students who were enrolled full-time at Ivy Tech prior to May 1982 are eligible for social security benefits.

During the phase-out of the program, benefits to eligible students will be reduced by 25% each year until April 1985, at which time post-secondary educational benefits through the Social Security Administration will end.

### ***Vocational Rehabilitation***

Students with disabilities that may be considered handicaps to employment may qualify for benefits through the Indiana Rehabilitation Services Board. The local office of the Division of Vocational Rehabilitation (DVR) establishes the conditions of eligibility and awards assistance, based on individual need. The DVR expects students to apply for the Pell Grant and other forms of financial aid through the school. However, if these resources are not sufficient to

meet their needs, the DVR may provide additional funding. Contact the local DVR counselor for further information.

### ***Job Training Partnership Act (JTPA)***

Students from economically disadvantaged backgrounds may be able to obtain assistance in acquiring vocational training or in upgrading occupational skills through the Job Training Partnership Act as implemented in October 1983. For further information, the student should contact the local Occupational Development office.

### ***Police and Firefighters Orphans***

Children of deceased, regular-paid, law enforcement officers and firefighters are eligible for a fee waiver if the parent's death occurred in the line of duty. The fee waiver is granted only to full-time students under the age of 23. Certification from the appropriate agency must be presented to the College in order to obtain the fee waiver.

### ***Application Procedures for Financial Aid***

Application forms are available in the regional Financial Aid Office. Because application procedures, deadlines, eligibility regulations, and refund policies vary with different types of student aid, interested students are encouraged to contact the Financial Aid Office at their earliest convenience.

## **STUDENT RECORDS**

Indiana Vocational Technical College, in compliance with the Buckley Amendment to the federal General Education Provisions Act, provides for the privacy of students and their parents regarding access and disclosure of records maintained by the College. No personal student information, other than directory information, may be released by the College without the permission of the student.

The following personal student data is designated as directory information:

1. Name
2. Address
3. Date of birth
4. Major field of study
5. Participation in officially recognized activities and sports
6. Weight and height of members of athletic teams
7. Dates of attendance
8. Degrees and awards received

### 9. The most recent previous educational institution attended

A student can refuse to permit disclosure of all or any part of the directory information by filing a written refusal, designating the particular information to be withheld, at the Office of Student Services.

Student records are held in security by the College. All transcripts on file with the College from high schools and other institutions of higher education cannot be released by Ivy Tech. A student needing a transcript from high school or another college should request it directly from that institution.

The Office of Student Services will assist students wishing to see and review their academic records and student files. All questions concerning student records and information should be directed to the Office of Student Services.

## ACADEMIC GRADING PROCEDURES

The academic grading system consists of grades and status. A grade indicates the quality of performance and level of competency achieved by a student at the completion of a course. Status is a condition to which no letter grade or grade points are assigned. Instructors determine and assign grades and status, based on objective and subjective appraisal and evaluation of students' performances. Students receive quarterly reports of their grades and/or status. THE QUARTERLY GRADE REPORT IS NOT MAILED TO STUDENTS WHO STILL OWE FEES.

### Grades

The quality of student performance or competency level, as determined by the instructor at the completion of a course, is indicated by a letter grade of A, B, C, D, or F. Each letter has a numerical value per credit hour, referred to as "grade points." The meaning and grade point value per credit hour of each letter grade is shown in the table below:

Grade	Interpretation	Grade Points Per Credit
A	Superior	4
B	Above Average	3
C	Average	2
D	Below Average	1
F	Unsatisfactory	0

## Status

Status describes a state or condition of a course appearing on the student's record that does not receive a grade. Grade points do not apply to status. The types of status and the symbols used to indicate them are shown below:

### Status

IP	In Progress
I	Incomplete
W	Withdrawal
AU	Audit
S	Satisfactory/Test-out
T	Transfer

### ***IP - In Progress***

In Progress (IP) describes an intermediate status applicable only to courses that are entirely individualized or to courses open to enrollment at any time during a given quarter. Students who, at the end of any College quarter, have not completed such courses but plan to continue the course work into the next quarter can be assigned an IP status. The course work should be completed, with grade awarded, within a time period comparable to that usual for regularly scheduled classwork unless otherwise authorized by the Director of Instruction. An intermediate status must be converted to a grade within a specified period of time.

### ***I - Incomplete***

Incomplete (I) describes an intermediate status assigned only when the student 1) has not completed certain course requirements, and 2) has made arrangements with the instructor to complete the unfinished work. The instructor will designate the time period in which the final test or course work is to be completed. This period should not exceed thirty calendar days following the last day of the quarter for which the incomplete status was assigned, unless otherwise authorized in writing by the Director of Instruction.

### ***W - Withdrawal***

Withdrawal (W) is terminal status. A student who completes the required drop/add form may withdraw from a course during weeks 4, 5, or 6 of the quarter without the instructor's approval. The student's record will indicate status W in place of a grade for that course. After the sixth week the instructor's approval is required. Should an

instructor refuse to approve a request for voluntary withdrawal, the student will be assigned a grade commensurate with the course requirements. Instructors can, with the approval of the Director of Instruction, withdraw students for excessive absence or for extenuating circumstances, such as an accident. Students will be notified prior to such action.

### ***AU - Audit***

Audit (AU) status indicates enrollment in a course for no grade or credit. Students enrolling in courses for audit will pay the same fees as those enrolled for credit. Audit status must be declared at time of registration.

### ***S - Satisfactory/Test-out***

Satisfactory (S) status indicates fulfillment of course requirements based on test-out, work experience, or previous education. Course credit may be granted on the basis of examination (test-out) and/or evaluation of previous work and training.

### ***T - Transfer***

Transfer (T) status indicates acceptance by Ivy Tech of credit earned at other accredited post-secondary institutions. Transfer credit for grades of A, B, or C can be granted upon evaluation for equivalency and relevance. The final authority for T credit rests with the Director of Instruction.

## **Credit Hour**

Credit is described in quarter hours (the number of credits taken per quarter). The number of credits is determined by the demands of the course and coursework and by the number of contact hours -- the hours actually spent in the classroom or laboratory. A 3-credit course, for example, may entail 4 hours per week of actual classroom and/or lab work.

## **Grade Points**

Grade points are numerical values indicating the quality of student performance in credit courses: A=4; B=3; C=2; D=1; F or W=0. The grade points earned for a course equal the grade point value times the number of credits. A student who earns an "A" in a 4-credit course earns 16 grade points; the grade point value (4) x the number of credits (4) = total grade points (16).

## Grade Point Average

The grade point average (GPA) is a numerical indication of the student's performance in all courses attempted during a single quarter. The GPA is obtained by dividing the number of grade points earned in the quarter by the number of credits attempted. The average, calculated to three decimal places, will appear on each quarterly grade report.

COURSE	GRADE	GRADE POINT VALUE	CREDITS
XXXX	B	3	4
XXXX	A	4	3
XXXX	A	4	5
TOTAL GRADE POINTS (44) TOTAL NUMBER OF CREDITS (12)			
= GPA (3.666)			

## Grade Point Index

The grade point index (GPI) is a measure of the student's cumulative scholastic performance. The GPI is obtained by dividing the total number of grade points earned by the total number of credits attempted. The index, calculated to three decimal places, will appear on each quarterly grade report.

## Improving a Grade

Students, with approval of faculty advisors, may attempt to improve grades by repeating courses. Financial aid recipients, however, should review their situations carefully, since payment for repeated courses can be disallowed. Permanent student records contain complete files of all activity. The grade point index will reflect the highest grade earned.

## Grade Reports

Final grades are mailed to the address on the registration form. Grade reports are not sent if there are outstanding financial obligations to the College.

## Maximum Class Load

An average full-time class load per quarter in most Ivy Tech programs consists of 15-16 credit hours. A class load of more than 20 credit hours requires the approval of the Director of Instruction.



## **Attendance**

Regular attendance is expected at scheduled class meetings or other activities assigned as part of a course of instruction. Instructors will maintain attendance records.

Personal circumstances may occasionally render it impossible for students to attend scheduled classes and activities. The College expects students to confer with instructors when such circumstances can be anticipated. With advance notification, instructors can offer students the option of making up the material missed. When circumstances are unforeseen, students should consult with their instructors to arrange make-up work, if possible. Absences may be considered by instructors in awarding grades.

Students who must interrupt their Ivy Tech training to fulfill reserve and National Guard annual tour requirements should present official military orders to their instructors prior to departure for duty. Students are not excused from completion of the course work and should make arrangements with their instructors to complete all work.

## **Dean's List**

The Dean's List, prepared and published each quarter, gives recognition to students who achieve a 3.50 grade point index or higher while enrolled for 12 or more credits during the quarter.

## **Standards of Progress**

Students are expected to maintain a quarterly GPA of 2.00. Students receiving financial aid must demonstrate progress toward completion of a program within a specified time frame based on their enrollment status and must complete successfully the minimum number of credit hours required for that status each quarter. All students are expected to maintain a 2.00 in all courses within certification requirements and to maintain a cumulative 2.00 for graduation eligibility.

## **Academic Probation**

A student is placed on academic probation when he/she fails to maintain the standards of progress. At this point counselling and/or advising may intervene. Students are automatically removed from probation if satisfactory progress is reestablished the following quarter.

## **Unsatisfactory Progress**

If a student on academic probation fails to meet the standards of progress for two consecutive quarters, he/she is given unsatisfactory progress status. At this point counselling and/or advising will intervene. For further information, contact the Office of Student Services.

## **Special Problems**

Students should see the Director of Student Services regarding College procedures for solving special problems, granting exceptions, and filing grievances. Special problems, exceptions, and grievances are ultimately the responsibility of the vice president/dean of the region and his designated staff and committees.

## **GRADUATION CERTIFICATION ELIGIBILITY STANDARDS**

The degree of Associate in Applied Sciences or other appropriate certificate is awarded by the College to students who meet graduation and certification eligibility requirements. Graduation ceremonies are held at least once a year. Graduating students are charged a fee to cover the cost of the ceremonial cap and gown.

To be considered for graduation, a student must first submit an application for graduation to the Student Services Office.

Each student entering the final quarter of training prior to graduation will complete an application for graduation. The application will be certified by the student's advisor and forwarded to the Office of Student Services, where the appropriate diploma will be prepared. Diplomas will not be prepared for students failing to make application for graduation.

A student is considered eligible for graduation when he/she fulfills the requirements for graduation and certification eligibility at his/her program level.

To graduate with an Associate in Applied Sciences Degree, the student must:

1. attain a grade point index of 2.0 in the required technical and general education courses, with not more than one course in each of these areas at a "D" or lower performance level;
2. complete successfully all courses within certification requirements with a grade point index of 2.0;
3. earn the last 15 credits as a regular student of Ivy Tech, rather than by test-out or other means of advanced placement;
4. complete successfully the Ivy Tech certification requirements;
5. satisfy all financial obligations to the College.

To graduate with a Technical Certificate, the student must:

1. attain a grade point index of 2.0 in the required technical courses with not more than one course at a "D" or lower performance level;
2. complete successfully all courses within certification requirements with a grade point index of 2.0;
3. earn the last 15 credits as a regular student of Ivy Tech, rather than by test-out or other means of advanced placement;
4. complete successfully the Ivy Tech certification requirements;
5. satisfy all financial obligations to the College.

To graduate with an Occupational Certificate, students must:

1. earn all credits within current certification requirements at Ivy Tech (no provision for transfer of credits from other institutions will be made);
2. complete successfully all courses within certification requirements with a cumulative grade point average of 2.0;
3. satisfy all financial obligations to the College.

## PLACEMENT

The Placement Office at each region of Ivy Tech assists registered graduates and students in finding jobs. Interested students should register for placement assistance at the Office of Student Services. The College cannot guarantee job placement.

Candidates for graduation who desire placement assistance should contact the Office of Student Services, which will:

1. advise candidates of the College placement services;
2. distribute registration forms for the placement service;
3. provide occupational information, including employment trends and local and state occupational outlook data;
4. assist the registered candidate in preparing a packet of credentials for use in finding a job. The packet may include:
  - a. a resume of the candidate's education and employment experience;
  - b. personal letters of recommendation verifying the student's employability;
5. create folders for all registered candidates, containing original copies of the candidate's credentials;
6. prepare copies of credentials released by the candidates for referral to prospective employers. Alumni may update their credentials whenever they wish to use the placement service.

Students registered with the College Placement Office will be

informed of employment opportunities known to the regional Placement Offices.

Employers who register with the Placement Office are given the names of all qualified candidates without regard to sex, race, age, national origin, or handicap. Registered students are eligible for interviews with appropriate prospective employers.

## **STUDENT ORGANIZATIONS AND ACTIVITIES**

The College holds that extracurricular activities should complement the academic program of the institution. Students are advised to participate in any or all phases of the student activities program when consistent with sound educational practices.

All student organizations must operate under the policies and guidelines set for the College by the State Board of Trustees. No student organizations will be permitted to function in College facilities without the approval of the administration and Student Senate. All approved organizations must be open for membership to all eligible candidates and must make available to the Student Senate all records of officers, membership, and financial transactions.

### **Student Senate**

Students in each region are provided opportunities to participate in student government through membership in the Student Senate. The Student Senate is the representative governing body of the students. Student Senate representatives are elected or selected according to the bylaws of each regional Student Senate constitution and serve as stated in those bylaws.

The student body membership may consist of representatives of the first-year class, the second-year class, each program area (offered in the region), and a faculty advisor as established in the bylaws of that region.

The Student Senate was established by students to encourage participation in student government and to promote College spirit and recognition. Unless it is otherwise delegated, the Student Senate exercises the authority to legislate on subjects concerning student affairs, subject to the approval of appropriate College administrative offices.

The constitutions of all student organizations must be approved by a quorum of the Student Senate, consisting of a simple majority of the total membership and one staff advisor, or as otherwise stated in the bylaws.

The functions of the Student Senate include:

1. communication of bona fide concerns of the student body and suggestions for improvement to appropriate College officials;
2. approval of those student organizations deemed beneficial to student life and worthy of being a part of the College;
3. assurance that copies of the constitution, bylaws, and statement of purpose and objectives of each recognized student organization are on file in the Office of Student Services.
4. referral of student grievances concerning disciplinary matters or student status to the Committee on Student Status; referral of other types of student grievances to appropriate College officials;
5. planning and conducting of appropriate extracurricular student activities;
6. submission of student activity budgets for review and approval by the regional administration.

## **Intramural Sports**

College sports activities consist of intramural sports sponsored by the Student Senate. Leagues can be formed where the interests of the students justify their organization. All sports activities of the College must be approved and sponsored by the Student Senate and the administration.

## **Class Organizations**

The primary purpose of class organizations is to promote class-wide social activities and sports functions. Each first- and second-year class may elect a class president, vice president, secretary-treasurer, class reporter, and representatives at-large for the Student Senate. Class organizations must be sponsored by the Student Senate.

## **Clubs**

Students wishing to organize hobby, social, or special interest clubs should submit proposals to the Student Senate, which will determine whether sufficient interest exists to form or continue a club. The Student Senate is authorized to charter the club upon approval by the administration. Each club must have the following elected officers: president, vice president, secretary-treasurer, club reporter, and a Student Senate representative. Each club must also have a staff advisor.

## **Social Activities**

All group activities of the College must be approved and sponsored by the Student Senate and the administration. Classes, clubs, and other groups should plan and conduct social activities pertaining specifically to their members. The Student Senate organizes and conducts school-wide social activities and gatherings in which all students and their guests may participate.

## **Professional and Trade Societies**

Student chapters of various professional and trade societies will be formed in the same manner as other student organizations and are subject to the same requirements.

## **STUDENT RIGHTS AND RESPONSIBILITIES**

### **Standards of Conduct**

Students enrolled at Indiana Vocational Technical College are expected to conduct themselves in a mature, dignified, and honorable manner. The reputation of the College in the community depends in large part upon the behavior of its students.

Students are subject to College jurisdiction on College matters during their period of enrollment. The College reserves the right to take disciplinary action against any student whose conduct, in the opinion of Ivy Tech representatives, has not been in the best interests of other students or the College. Disciplinary action may consist of verbal reprimand, restitution for damages, restriction of privileges, suspension, or dismissal. Students, in turn, have the right of due process.

All Ivy Tech students are expected to abide by the following College rules of conduct.

### **College Rules**

#### **1. ALCHOLIC BEVERAGES**

Any student found guilty of drinking, being under the influence of, or possessing intoxicating beverages on College property is subject to disciplinary action and state law.

#### **2. ILLEGAL USE OF DRUGS**

The illegal use of drugs is strictly prohibited on College property. Any student found using, under the influence of, in possession of, or distributing illegal drugs is subject to disciplinary action and state law.

### 3. SMOKING

Students may smoke in private offices, conference rooms, and other areas as designated by the vice president/dean. Smoking is generally prohibited in carpeted areas and in posted "No Smoking" areas in accordance with fire regulations as well as consideration for campus environment.

### 4. ASSEMBLY

Persons shall not assemble in a manner that obstructs the free movement of others about the campus, inhibits the free and normal use of the College buildings and facilities, or prevents or obstructs the normal operations of the College.

### 5. SIGNS

Students may not erect signs on campus or display signs or posters, except on designated bulletin boards, without the authorization of the vice president/dean or his designee. Also, students shall not deface, alter, tamper, destroy, or remove any sign or inscription on College property.

### 6. SOLICITATION OF FUNDS

No student or student organization may use campus facilities or schedule activities to solicit funds without the approval of the vice president/dean or his designee.

### 7. ARMS/DEADLY WEAPONS

Firearms (except for those possessed by police officers) are strictly prohibited on College property or at any College-sponsored activity held elsewhere. Any student possessing deadly weapons at these locations is subject to disciplinary action.

### 8. CHEATING

Any student found cheating on papers or tests is subject to disciplinary action. Such action may be taken in accordance with College procedures as deemed necessary by the instructor.

### 9. COUNTERFEITING AND ALTERING

Students shall not copy or alter in any manner, shape, or form any record, document, or identification form used or maintained by the College.

### 10. THEFT OF PROPERTY

Any theft of personal or College property will be treated as a violation of College rules.

### 11. VANDALISM

The destruction or mutilation of College books, magazines, equipment, or buildings is prohibited. Such action may result in restitution and/or other disciplinary measures.

## 12. USE OF COLLEGE FACILITIES

Students are permitted on campus during normal College hours and at other times established in the College calendar. Students wishing to utilize College facilities at other times must request permission from the vice president/dean or his designee.

## 13. FINANCIAL RESPONSIBILITY

Students owing fees, fines, or loans shall not be permitted to register for a succeeding session. Grades, records, degrees, etc., will not be awarded until debts to the College are paid.

## 14. MOTOR VEHICLES

The College has established student, staff, and visitor parking areas. All persons are required to park in their respectively designated areas and to adhere to College parking regulations. Posted speed limits must be obeyed.

## Violations

Persons found in violation of laws and ordinances on College property shall be subject to prosecution by the appropriate law enforcement official(s).

Persons found in violation of College regulations shall be subject to disciplinary action by the College through due process procedures for student conduct violations.

The College maintains jurisdiction over matters such as, but not limited to, alcoholic beverages, illegal use of drugs, smoking, financial responsibilities, motor vehicles, assembly, soliciting, use of College facilities, the posting or erection of signs, theft, arms/deadly weapons, cheating, counterfeiting, and vandalism.

The vice president/dean designee in the Office of Student Services will make available copies of the student conduct regulations to all students not later than the first day of instruction.

## Due Process Procedures for Student Conduct Violations

1. Cases or appeals of student misconduct and/or lack of academic integrity are to be referred to the appropriate designee of the vice president/dean or to the Chair of the Student Status Committee for evaluation. This College representative:
  - a. will be responsible for all initial disciplinary procedures;
  - b. may recommend temporary suspension of a student to the vice president/dean for a period of time until the Student Status Committee can meet.



- c. may recommend to the vice president/dean (on recommendation of the instructor) that a student be withdrawn from a course or program or from the College for disciplinary reasons.
2. Students recommended for dismissal will be notified by their advisors in writing. Students will be given an opportunity to appeal the decision of the Student Status Committee if they so choose. Each region of the College has a Committee on Student Status, composed of at least two instructors, two students designated by the Student Senate, and two administrative persons.
3. The Student Status Committee deals with all cases relating to disciplinary actions or the academic status of students. Each regional institute has a Student Status Committee that makes recommendations to the vice president/dean.
  - a. The Student Status Committee will be composed of at least six members, including two full-time instructional staff members and two administrative staff persons appointed by the vice president/dean of the region. The additional two members will be students designated by the Student Senate. The Committee's review and subsequent disposition of a formal complaint will begin no later than thirty (30) days after receipt of the written complaint. Staff legal counsel, as needed, will be available to the Committee.
  - b. The Student Status Committee will assure the student due process. A written statement will be presented to the student by the chairman of the Student Status Committee. The student will be invited to speak on his/her own behalf.
  - c. The Student Status Committee will issue a recommendation to the vice president/dean following its deliberation. Disciplinary probation or dismissal from the College will be final only after review by the vice president/dean, who may approve or disapprove the recommendation of the Student Status Committee. (STUDENTS DISMISSED FOR DISCIPLINARY REASONS WILL NOT BE ENTITLED TO REFUNDS).
  - d. The student will be informed in writing of the decision of the Student Status Committee and of the subsequent recommendations to the vice president/dean, whose decision is final. A copy of the written recommendations from the committee will be filed in the student's folder in the Office of Student Services.
  - e. If the student disagrees with the Student Status Committee recommendation, he may file a complaint with the regional vice president/dean within 72 hours after notification of the Student Status Committee's decision.
  - f. Exceptions to these rules may be made in extenuating circum-

stances at the discretion of the vice president/dean or his designee upon request by the party involved.

## **Student Grievances**

Students may bring legitimate grievances to the attention of their instructors or other advisors. Time will be provided for grievance conferences within two weeks of the complaint. The purpose of the conference is to discuss the problem and to find, if possible, a mutually satisfactory resolution.

If the grievance concerns an instructor or an advisor, the student may request a conference with a department head, chairperson, the Director of Student Services, or the Director of Instructional Affairs, as deemed appropriate. The conference will be held within two weeks of notice of the complaint.

The student who feels his grievance has not been adequately addressed by these methods may follow a prescribed formal grievance procedure. A full explanation of this procedure is available from the Office of Student Services.

## **GENERAL INFORMATION**

### **Student Parking Registration**

Registration of motor vehicles parked on the College premises is required to help maintain a safe and organized parking area. The student will receive a parking sticker from the cashier's office at the time of registration. The sticker must be displayed on the student's vehicle at all times while on campus. Students are expected to park only in designated student parking areas. Vehicles improperly parked in areas reserved for the handicapped, visitors, or others may be towed away at the owner's expense. The special permit required to park in the handicapped zone must be requested from the Director of Student Services.

### **Housing**

Indiana Vocational Technical College does not operate residence halls. Limited assistance is provided by the Office of Student Services to out-of-town students needing accommodations. The College accepts no responsibility for locating, approving, or supervising local student housing.

## **College Bookstore**

The College maintains a bookstore in each regional institute. All books and regular supplies needed by students throughout the academic year will be for sale at the bookstore. College sweaters, jackets, souvenirs, and other items may also be available for purchase.

## **Student Insurance**

Each Ivy Tech student registered in credit courses is insured for some loss resulting from injuries sustained while participating in College-sponsored activities, provided the activity takes place on College-designated premises. An Ivy Tech student, registered in credit courses and traveling in a student group under College supervision, is also covered during the period of direct travel to and from a sponsored activity. College coverage is not intended to replace individual insurance coverage. The student is encouraged to review his/her own coverage.

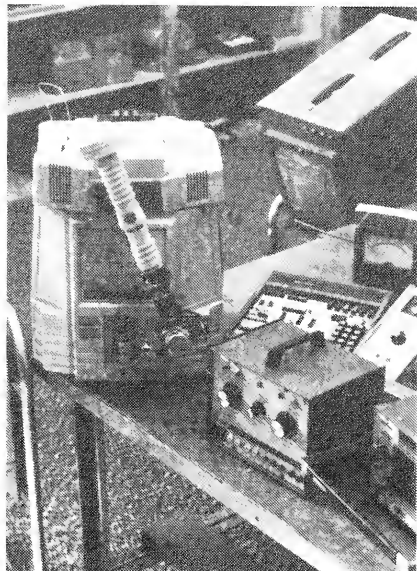
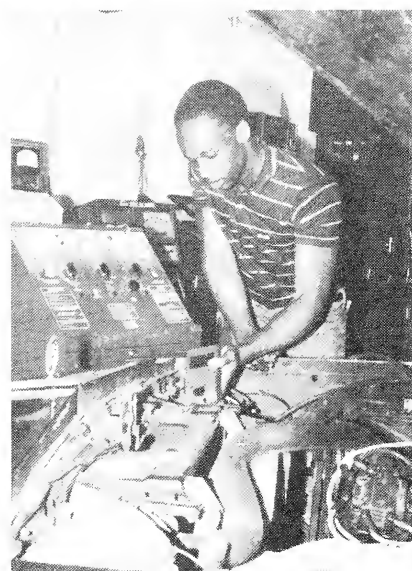
The student should contact the Student Services Office for further information concerning the types of hazards insured, the benefits provided, and the exclusions that may be applicable to the Master Policy. This description is intended only as a brief summary not a full description of insurance coverage.

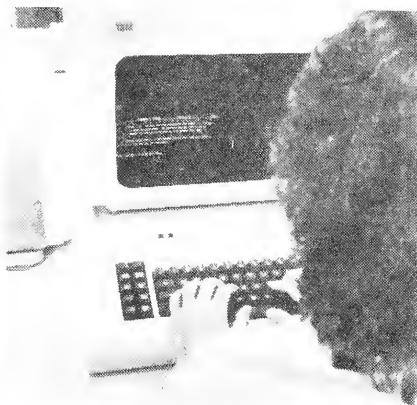
## **Library Facilities**

The Library/Learning Resources Center offers reference materials, leisure reading, materials related to all program areas of the College, career exploration materials, general magazines and newspapers, audiovisual materials and equipment, interlibrary book loans, textbooks on reserve for in-library use, reference services, and library use assistance.

## **Emergency Closing of Campus**

Severe weather conditions or other emergency may necessitate closing a campus. Students will be notified of emergency closings by mass media. Students should listen to designated local radio stations for news of emergency closings.





# PROGRAMS OF THE COLLEGE

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In keeping with its mission and goals, the College serves people of all ages with educational programs consistent with current and projected job requirements. Ivy Tech programs complement secondary vocational, four-year engineering, and basic adult education programs. The purpose of this training is to 1) develop competent workers for initial employment, and 2) upgrade the skills of those already employed. All Ivy Tech programs provide training in skills and instruction in recent technological advancements and developments in occupational areas.

The programs at Ivy Tech are designed to meet the needs of the student population — accommodating those who wish to enroll in a few classes as well as those who prefer a full program. Credit programs, culminating in technical certificates or the Associate in Applied Science degree, are offered in 53 program areas in four College divisions: Business Sciences, Graphics and Media, Health Occupations, and Trade and Technical. Short-term training is also available in custom-designed credit courses for local businesses and industries, contract training programs, and such noncredit instructional activities as seminars, workshops, and conferences.

The credit programs in each of Ivy Tech's four divisions require a minimum of 45 credits for completion of a technical certificate program and 90 credits for completion of an associate degree. All programs include technical and general education courses that are standard requirements for graduation in each of Ivy Tech's thirteen regions. Regionally determined electives provide flexibility to meet local employers' needs.

On the following pages are the current listings of courses within each credit program area offered by Ivy Tech in one or more of the College's thirteen regional centers. Approval has been granted to offer some courses at the associate degree level, others at the technical certificate level. The listings indicate the highest level at which a program can currently be offered by the College in any region. Every program, however, may not be available at the highest level in every region. Contact the center nearest you for information concerning the level of specific program offerings in your area.

# BUSINESS SCIENCES DIVISION

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Career opportunities in business are expanding rapidly. Employment statistics indicate that the better jobs in business will be filled by persons equipped with the technical skills required in today's business world. The Business Science Division of Ivy Tech, recognizing the impact of changing technology on business careers, offers programs designed to prepare the student for employment in one of many occupations relevant to Indiana businesses.

## ACCOUNTING TECHNOLOGY

The program develops understanding of accounting principles, business law, communications, and business machines used in the field. Training is offered in the newest computerized accounting systems. Technical skills in cost accounting, tax preparation, auditing, budgeting, and consumer credit are emphasized. A concentrated option in credit and finance is available on a regional basis.

Typical duties in accounting include posting accounts receivable and payable, preparing and making bank deposits, billing, working on payroll, maintaining inventory records, purchasing supplies, and processing expense reports. Position titles may include junior accountant, junior auditor, cost accounting clerk, bookkeeper, and management trainee.

Programs and courses are offered in Anderson, Bloomington, Columbus, Connersville, Evansville, Fort Wayne, Gary, Indianapolis, Kokomo, Lafayette, Lawrenceburg, Logansport, Madison, Muncie, New Castle, Richmond, Sellersburg, South Bend, Terre Haute, and Warsaw. In addition, selected courses are available in Angola, Attica, Berne, Bluffton, Boonville, Brownsburg, Columbia City, Connersville, Crane, Crawfordsville, Danville, Delphi, Elkhart, Fowler, Frankfort, Greenfield, Hammond, Huntington, Kendallville, Lebanon, Liberty, Linton, Marion, Martinsville, Monticello, Mount Vernon, Princeton, Rushville, Tell City, Valparaiso, Wabash, Washington, and Westfield.

The Business Sciences Division offers a two-year Accounting Technology program, requiring 94 credits, that leads to an Associate Degree in Applied Science. A one-year Technical Certificate program and a shorter-term Occupational Certificate program are also available. Please contact your local center for information concerning specific courses or the programs offered.

## TECHNICAL COURSES (45 Credits)

Course #	Course Title	Credits
0110	Accounting Principles 1	4
0120	Accounting Principles 2	4
0122	Business Law 1	3

0130	Accounting Principles 3	4
0140	Intermediate Accounting 1	4
0141	Individual Income Taxes	4
0142	Job Order Cost Accounting	4
0143	Business Law 2	3
0150	Intermediate Accounting 2	4
0151	Process Cost Accounting	4
0160	Intermediate Accounting 3	4
1236	Office Calculating Machines	3

## GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

## REGIONALLY DETERMINED ELECTIVES (29 Credits)

Electives	29
Total credits	94

**ACCOUNTING TECHNOLOGY - CREDIT AND FINANCE OPTION**

The two-year program option in credit and finance, requiring 105 credits, leads to an Associate Degree in Applied Science. The credit and finance option can also lead to a one-year Technical Certificate or a shorter-term Occupational Certificate.

## TECHNICAL COURSES (51 Credits)

Course #	Course Title	Credits
0110	Accounting Principles 1	4
0120	Accounting Principles 2	4
0122	Business Law 1	3
0130	Accounting Principles 3	4
0143	Business Law 2	3
0171	Principles of Finance 1	3
0172	Principles of Finance 2	3
0173	Consumer Credit	3
0174	Credit Procedures	3
0175	Credit Management 1	3
0176	Credit Management 2	3
0177	Commercial Credit	3
0178	Credits and Collections	3
0323	Business Principles and Organization	3
0913	Techniques of Supervision 1	3
1236	Office Calculating Machines	3

## GENERAL EDUCATION COURSES (23 Credits)

Course #	Course Title	Credits
0153	Microeconomics	3
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8213	Mathematics of Finance 1	4
8401	Human Relations	4

## REGIONALLY DETERMINED ELECTIVES (31 Credits)

Total	31
	105



## SMALL ENTERPRISE/OFFICE OPERATIONS TECHNOLOGY

The program covers supervisory and managerial skills needed for general administrative positions with small and medium sized firms and retail commercial businesses, such as fast foods, appliance sales, auto parts, gas stations, small loan offices, grocery markets, and retail shops. The program emphasizes accounting, business law and principles, retailing, advertising, insurance, buying and inventory control, and management.

The curriculum is also designed for entry-level managerial and supervisory jobs pertaining to office administration and management in small and medium-sized firms or in departments of larger organizations. Emphasis is placed upon technical skills in accounting, supervision, office administration, personnel administration, and marketing.

Programs and courses are offered in Columbus, Evansville, Fort Wayne, Indianapolis, Lafayette, Madison, Marion, Muncie, Richmond, Sellersburg, South Bend, and Terre Haute. In addition, selected courses are available in Anderson, Angola, Attica, Berne, Bluffton, Boonville, Columbia City, Crane, Crawfordsville, Delphi, Fowler, Frankfort, Gary, Hammond, Huntington, Kendallville, Kokomo, Lawrenceburg, Logansport, Monticello, Mount Vernon, New Castle, Princeton, Tell City, Valparaiso, Warsaw, and Washington.

A two-year program, requiring 90 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate. The student is advised to contact the nearest center concerning specific courses or the programs offered.

### TECHNICAL COURSES (17 Credits)

Course #	Course Title	Credits
1 Course in each of the following areas:		
	Business Foundation	3
	Business Law	3
	Management/Supervision	3
	Accounting	4
	Purchasing and Inventory Control	4

### GENERAL EDUCATION COURSES (24 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8213	Mathematics of Finance 1	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (49 Credits)

Electives	49
Total credits	90

## COMPUTER PROGRAMMING TECHNOLOGY

The program trains computer programmers, systems analysts, technicians, and operators. BASIC, COBOL, FORTRAN, RPG-2, and special languages are taught, using standard equipment and micro-computers. Other courses in the curriculum include data processing fundamentals, problem-solving fundamentals, systems analysis and design, and operating systems. Emphasis on business, graphics, and/or trade and technology may be available on a regional basis.

Systems analysts prepare problem descriptions, detailing the steps the computer must follow in solving the problem. The applications programmer then writes a specific program for the problem, using an appropriate computer language. In smaller organizations the programmer-analyst is responsible for both functions. Computer operators monitor and control the computer, deciding what equipment should be used for each job, processing the input, and monitoring the computer while it is in operation.

Programs and courses are offered in Anderson, Bloomington, Columbus, Connersville, Evansville, Fort Wayne, Gary, Hammond, Indianapolis, Kokomo, Lafayette, Logansport, Madison, Marion, Muncie, Richmond, Sellersburg, South Bend, Tell City, Terre Haute, Valparaiso, and Warsaw. In addition, selected courses are available in Angola, Attica, Berne, Bluffton, Boonville, Columbia City, Connersville, Crane, Crawfordsville, Delphi, Fowler, Frankfort, Franklin, Huntington, Kendallville, Lawrenceburg, Liberty, Linton, Marion, Monticello, Mount Vernon, Princeton, Rushville, Warsaw, and Washington.

A two-year program, requiring 100 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and the shorter-term Occupational Certificate. The student is requested to contact the nearest center concerning specific courses and the programs of study offered.

### TECHNICAL COURSES (58 Credits)

Course #	Course Title	Credits
0110	Accounting Principles 1	4
0120	Accounting Principles 2	4
0510	Fundamentals of Data Processing	5
0520	COBOL Programming Fundamentals	5
0522	Problem Solving Fundamentals	3
0530	Advanced COBOL Programming	5
0531	Operating Systems	5
0540	Systems Analysis and Design	4
0560	Data Communications	4
	Electives - Programming Courses	19

### GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8203	Technical Mathematics 1	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (22 Credits)

Electives

	<u>22</u>
Total credits	100

## HOTEL-MOTEL MANAGEMENT (HOSPITALITY)

Courses develop both managerial and technical skills, including hospitality management, front office procedures, food and beverage management, service, purchasing and control, sales, and maintenance. Related courses are available in accounting, supervision, communications, and mathematics.

Programs and courses are offered in Indianapolis. In addition, selected courses are available in Evansville, Madison and Sellersburg.

A two-year program, requiring 90 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate or the shorter term Occupational Certificate. The student is advised to contact the nearest center concerning specific courses and the programs offered.

### TECHNICAL COURSES (37 Credits)

Course #	Course Title	Credits
0711	Introduction to Hospitality Management	4
0712	Front Office Procedures	4
0733	Food and Beverage Management and Service	4
0742	Food and Beverage Purchasing and Control	4
0744	Sanitation	4
0752	Sales Promotion	4
0760	Hotel-Motel Maintenance 1	3
0762	Supervisory Housekeeping	4
0763	Hotel-Motel Maintenance 2	3
3444	Introduction to Food Service	3

### GENERAL EDUCATION COURSES (24 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8213	Mathematics of Finance	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (29 Credits)

Electives		29
Total credits		90

## QUALITY CONTROL TECHNOLOGY

The program prepares students to enter the quality control field or to provide employed persons the opportunity to upgrade skills. Areas of study include statistical concepts and skills, development and use of sampling plans and control charts, measurements, nondestructive testing, reliability techniques, quality control procurement practices, and basic management principles. Graduates are eligible to take the American Society of Quality Control examination, which leads to certification as a Quality Control Technician.

Under professional direction, the technician analyzes and solves quality control problems, performs laboratory procedures, tests products and equipment, and prepares recommendations and reports to management.

The program and courses are offered in Indianapolis and Muncie; selected courses are available in Evansville, Kokomo, Logansport, and South Bend.

A two-year program, requiring 90 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate.

### TECHNICAL COURSES (53 Credits)

Course #	Course Title	Credits
0901	Quality Control Concepts & Techniques 1	4
0902	Quality Control Concepts & Techniques 2	4
0903	Quality Control Engineering Principles & Techniques	4
0904	Statistical Concepts and Techniques	4
0905	Quality Control Engineering Theory & Applications	4
0907	Reliability Objectives	4
0908	Introduction to Nondestructive Tests	4
0909	Mechanical Metrology	4
0913	Techniques of Supervision 1	3
0915	Electrical Metrology	4
0916	Procurement Quality Control	4
0917	Reliability Techniques	4
0967	Drafting & Manufacturing Standards	3
9414	Blueprint Reading 1	3

### GENERAL EDUCATION COURSES (23 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8203	Technical Mathematics 1	4
8204	Technical Mathematics 2	4
8210	Statistics	3
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (14 Credits)

Electives

	14
Total credits	90

## INDUSTRIAL MANAGEMENT TECHNOLOGY

The program provides students with formal training in management. Students learn how to set goals, plan, organize, staff, direct, motivate, and control operations in an industrial setting. These skills are applied to supervision, quality control, production control, safety, and methods improvement.

Positions in the field include manager trainees and departmental and personnel assistants in manufacturing, service, and government agencies.

Programs and courses are offered in Anderson, Evansville, Fort Wayne, Indianapolis, Lafayette, Marion, Muncie, New Castle, South Bend, and Warsaw. In addition, selected courses are available in Angola, Attica, Berne, Bloomington, Bluffton, Boonville, Brownsburg, Columbia City, Columbus, Crane, Crawfordsville, Delphi, Elkhart, Fowler, Frankfort, Franklin, Gary, Greenfield, Grissom Air Force Base, Hammond, Huntington, Kendallville, Kokomo, Lebanon, Logansport, Madison, Martinsville, Monticello, Mount Vernon, Princeton, Richmond, Sellersburg, Tell City, Terre Haute, Valparaiso, Warsaw, and Washington.

A two-year program, requiring 90 credits, leads to an Associate Degree in Applied Science. Also offered are the one-year Technical Certificate and the shorter-term Occupational Certificate.

### TECHNICAL COURSES (32 Credits)

Course #	Course Title	Credits
0112	Accounting for Non-Majors	4
0122	Business Law 1	3
0154	Macroeconomics	3
0571	Survey of Business Data Processing	3
0901	Quality Control Concepts & Techniques 1	4
0913	Techniques of Supervision 1	3
0921	Principles of Industrial Safety	3
0923	Techniques of Supervision 2	3
0941	Labor Relations	3
0951	Production Planning and Control	3

### GENERAL EDUCATION COURSES (19 Credits)

Course #	Course Title	Credits
8110	Communications	4
8113	Oral Communications	4
8203	Technical Mathematics 1	4
8210	Statistics	3
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (39 Credits)

Electives

	<u>39</u>
Total credits	90

## SECRETARIAL SCIENCES

(Administrative, Word Processing, Legal, and Medical Options)

The program emphasizes typing, shorthand, filing, math, accounting, communications, office management, operation of various types office equipment, and other skills necessary for success as a secretary.

Several options are available in the Secretarial Science program. The Administrative Secretarial option trains the student to handle general office responsibilities, ranging from filing and letter-writing to statistical research and the writing of reports. The Medical Secretarial option emphasizes medical office administrative and clerical duties, including scheduling appointments, obtaining patient information, arranging hospital admissions, ordering supplies, billing, and completing insurance forms. The Legal Secretarial program teaches the student to conduct legal research and to assist in the preparation of briefs. It also offers training in legal bookkeeping and typing, legal office practice and procedures, and business law.

Word Processing, the newest option, offers training on state-of-the-art equipment in the secretarial labs. Because most businesses with recently installed word processing machines do not offer in-house training, Ivy Tech prepares its students with the skills to be competitive in this job market.

Programs and courses are offered in Anderson, Bloomington, Columbus, Evansville, Fort Wayne, Gary, Hammond, Indianapolis, Kokomo, Lafayette, Lawrenceburg, Logansport, Madison, Muncie, New Castle, Richmond, Sellersburg, South Bend, Tell City, Terre Haute, Valparaiso, and Warsaw. In addition, selected courses are available in Angola, Attica, Berne, Bluffton, Boonville, Brownsburg, Columbia City, Crane, Crawfordsville, Danville, Delphi, Elkhart, Fowler, Frankfort, Greenfield, Grissom AFB, Huntington, Kendallville, Lebanon, Linton, Marion, Martinsville, Monticello, Mount Vernon, Princeton, Washington, and Westfield.

### SECRETARIAL SCIENCES - ADMINISTRATIVE TECHNOLOGY Option

The program emphasizes typing, shorthand, filing, math, accounting, communications, and office management skills and the operation of various pieces of office equipment.

The aim of the program is to prepare the student for general office responsibilities, ranging from filing and letter-writing to statistical research and the writing of reports.

A two-year program, requiring 92 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

#### TECHNICAL COURSES (44 Credits)

Course #	Course Title	Credits
0122	Business Law 1	3
1210	Shorthand 1	4
1212	Typewriting 1	4
1220	Shorthand 2	4
1222	Typewriting 2	4

1224	Records Management	3
1230	Shorthand 3	4
1232	Typewriting 3	4
1236	Office Calculating Machines	3
1241	Clerical Office Procedures	3
1242	Typewriting 4	4
1262	Typewriting 5	4

## GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

## REGIONALLY DETERMINED ELECTIVES (28 Credits)

Electives	<u>28</u>
Total Credits	92

**SECRETARIAL SCIENCES - WORD PROCESSING TECHNOLOGY Option**

This option provides training in secretarial skills utilizing advanced technological equipment. Students learn to produce, edit, format, and print written communications with the aid of word processing technology. The program also includes training in the supervision of word processing operations.

The program emphasizes skills in typing, shorthand, filing, math, accounting, communications, office management, and the operation of general office equipment.

A two-year program, requiring 92 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

## TECHNICAL COURSES (32 Credits)

Course #	Course Title	Credits
1212	Typewriting 1	4
1222	Typewriting 2	4
1224	Records Management	3
1232	Typewriting 3	4
1241	Clerical Office Procedures	3
1255	Introduction to Word Processing	4
1256	Word Processing Operations	4
1257	Word Processing Applications	4
1267	Machine Dictation and Transcription	2

## GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4

8212	Business Mathematics	4
8401	Human Relations	4

## REGIONALLY DETERMINED ELECTIVES (40 Credits)

Electives	<u>40</u>
Total Credits	92

**SECRETARIAL SCIENCES - LEGAL TECHNOLOGY Option**

The program develops typing, shorthand, filing, math, accounting, communications and office management skills and the operation of various pieces of office equipment.

The legal secretarial option trains the student to conduct legal research and to assist the lawyer in preparing briefs. Training in legal bookkeeping and typing, legal office practice and procedures, and business law is included.

A one-year program, requiring 60 credits, leads to a Technical Certificate. Also offered is a shorter-term Occupational Certificate.

## TECHNICAL COURSES (30 Credits)

Course #	Course Title	Credits
0122	Business Law 1	3
0143	Business Law 2	3
1212	Typewriting 1	4
1222	Typewriting 2	4
1232	Typewriting 3	4
1267	Machine Dictation & Transcription	2
1310	Legal Terminology	2
1321	Legal Office Procedures	4
1342	Typewriting Legal	4

## GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

## REGIONALLY DETERMINED ELECTIVES (6 Credits)

Electives	<u>10</u>
Total Credits	60

**SECRETARIAL SCIENCES - MEDICAL TECHNOLOGY Option**

The program develops typing, shorthand, filing, math, accounting, communications, and office management skills and the operation of various pieces of office equipment.

The Medical Secretarial option prepares the student for administrative and clerical duties in medical offices. Training includes scheduling appointments, obtaining patient information, arranging hospital admissions, ordering supplies, billing, completing insurance forms, and other tasks related to the medical office.



A one-year program, requiring 60 credits, leads to a Technical Certificate. Also offered is a shorter-term Occupational Certificate.

#### TECHNICAL COURSES (18 Credits)

Course #	Course Title	Credits
1212	Typewriting 1	4
3721	Medical Office Procedures-Administrative	4
3722	Medical Typewriting 1	3
3732	Medical Office Communications	4
3743	Machine Transcription Medical 1	3

#### GENERAL EDUCATION COURSES (12 Credits)

Course #	Course Title	Credits
8110	Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

#### REGIONALLY DETERMINED ELECTIVES (30 Credits)

Electives	<u>30</u>
Total Credits	60

## MARKETING TECHNOLOGY

The program offers broad business training to prepare the student for employment opportunities in operations and management. Courses include marketing, management, business law, sales techniques, retailing, public relations, advertising, accounting, and related areas in mathematics, communications, and finance.

Career opportunities may be available in retailing, wholesaling, and manufacturing; in industrial and consumer markets; and in profit and nonprofit organizations.

Programs and courses are offered in Anderson, Evansville, Fort Wayne, Gary, Indianapolis, Kokomo, Muncie and Terre Haute. In addition, selected courses are available in Angola, Berne, Bluffton, Boonville, Columbia City, Columbus, Crane, Grissom Air Force Base, Hammond, Huntington, Kendallville, Lawrenceburg, Linton, Logansport, Madison, Marion, Mount Vernon, Princeton, Richmond, Sellersburg, South Bend, Tell City, Valparaiso, and Washington.

A two-year program, requiring 90 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (28 Credits)

Course #	Course Title	Credits
0112	Accounting for Non-Majors	4
1114	Marketing 1	4
1115	Sales Techniques	4
1116	Marketing 2	4
1135	Principles of Retailing	4
1136	Physical Distribution	4
1147	Principles of Advertising	4

### GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (42 Credits)

Electives

	<u>42</u>
Total Credits	90

## CULINARY ARTS TECHNOLOGY

The program exposes students to the different styles of outstanding chefs and experienced instructors and acquaints them with many types of equipment. In each course the students participate in food preparation, giving special attention to personal hygiene, food handling techniques, sanitation, and safety regulations. The program covers food, beverage, and volume food service, menu planning, international food preparation, classical cuisine, baking and pastries, wines and spirits, meat cutting, and fish and seafood preparation. An externship program may be available on a regional basis to offer students on-the-job training as employees of local food service businesses.

Programs and courses are offered in Fort Wayne, Hammond, and Indianapolis. In addition, selected courses are available in Angola, Berne, Bluffton, Columbia City, Huntington, and Kendallville.

A two-year program, requiring 96 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (48 Credits)

Course #	Course Title	Credits
3411	Introduction to Culinary Arts	2
3413	Introduction to Foods	2
3415	Introductory Baking	3
3416	Culinary Theory and Skills Development	3
3417	Pantry and Breakfast Cookery	2
3421	Nutrition	3
3423	Introductory Hot Food Preparation	3
3425	Introductory Table Service	2
3426	Purchasing, Storeroom Procedures, and Stewarding	2
3427	Institutional Food Service Systems	2
3428	Intermediate Hot Food Preparation	2
3430	Meat Cutting/Kitchen	3
3436	Advanced Baking/Classical Pastry	3
3440	International Food Preparation	3
3442	Buffet Catering	2
3459	Classical Cuisine & Banquet Organization	3
3461	A la Carte Food Preparation and Advanced Table Service	3
3462	Advanced Food Preparation and Banquet Service	3
3474	First Aid/Sanitation	2

### GENERAL EDUCATION COURSES (12 Credits)

Course #	Course Title	Credits
8110	Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (26 Credits)

Electives	36
Total Credits	96

# GRAPHICS AND MEDIA DIVISION

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The Graphics and Media Division offers opportunities to combine creative talent with practical applications. Hands-on instruction encourages originality, technical development, and familiarity with state-of-the-art equipment in the graphics and media field. Courses are structured to give a broad understanding of principles and to develop the skills needed for their efficient and effective application.

The Division offers two-year programs leading to an Associate Degree in Applied Science. The Division also offers a one-year Technical Certificate and a shorter-term Occupational Certificate. All courses offered in the graphics and media program may be taken for courses only. The student is advised to contact the nearest center concerning specific courses and program offerings.

## AUDIOVISUAL COMMUNICATIONS TECHNOLOGY

The program, covering audiovisual communications, commercial photography, commercial art, and electronics, prepares students for initial employment or upgrading skills in the field. The curriculum includes courses in radio and television, sound systems, AV production, AV equipment use and maintenance, visual arts, and photography.

The AV communications technician is trained to produce software for AV systems in industry, government, and educational institutions and to be knowledgeable concerning the operation and maintenance of commonly used AV equipment.

Programs and courses are offered in South Bend. In addition, selected courses are available in Elkhart, Gary, and Terre Haute.

The two-year program, requiring 105 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate. The student is advised to consult the nearest center concerning specific courses and program offerings.

### TECHNICAL COURSES (53 Credits)

Course #	Course Title	Credits
1808	Portfolio Preparation I	3
1858	Storyboard Techniques	2
1861	Storyboard Concepts	2
1901	Intro. to Audio Production	2
1902	Video Production I	3
1903	Video Production II	3
1904	AV Electronics	2
1905	Video Systems Design	2
1906	Script Writing for TV I	2
1907	Script Writing for TV II	2
1913	Advanced Color Video Production	4
1914	Advanced Audio Production	2
1942	Intro. Videotape Production	3
1953	Color Videotape Production	3
1961	Videotape Editing	2
1983	Special Effects in Color	4
1984	Advanced VTR Production	4
1985	Multitrack Sound Systems	3
1988	Sound Recording and Editing	3
1989	AV Equipment Utilization and Maintenance	2

### REQUIRED GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8401	Human Relations	4
8403	Psychology of Advertising	4

### REGIONALLY DETERMINED ELECTIVES (32 Credits)

Electives	<u>32</u>
Total Credits	105

## COMMERCIAL AND INDUSTRIAL PHOTOGRAPHY TECHNOLOGY

The program emphasizes the development of technical skills, from camera to darkroom. Courses are offered in photography fundamentals, photo materials, lighting and setup techniques, darkroom techniques, product photography, composition and design, color and black and white processes, and specialized commercial photography.

Programs and courses are offered in Columbus, Evansville, South Bend, and Terre Haute. In addition, selected courses are available in Anderson, Elkhart, Indianapolis, and Muncie.

A two-year program, requiring 105 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate.

### TECHNICAL COURSES (41 Credits)

Course #	Course Title	Credits
1614	Fundamentals of Photography 1	2
1615	Photographic Science and Theory 1	3
1616	Studio Practice 1	2
1624	Fundamentals of Photography 2	2
1625	Photographic Science and Theory 2	3
1626	Studio Practice 2	2
1627	Darkroom Techniques 1	2
1628	Darkroom Techniques 2	3
1634	Sequential Photography	3
1635	Product Photography	3
1636	Studio Practice 3	2
1638	Darkroom Techniques 3	2
1642	Industrial and Commercial Techniques 1	2
1645	Photographic Composition	3
1652	Industrial and Commercial Techniques 2	3
1663	Color Portraiture	2
1665	Custom Color Printing	2

### GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4
8403	Psychology of Advertising	4

### REGIONALLY DETERMINED ELECTIVES (44 Credits)

Electives

	<u>44</u>
Total Credits	105

## COMMERCIAL ART TECHNOLOGY

The program includes courses in drawing, composition and design, illustration media and techniques, visual arts, communications, typography, photography, copywriting, layout, life drawing, airbrush retouching, storyboard techniques, and portfolio preparation.

Commercial artists perform many tasks involving the use of art media to produce illustrations, graphic designs, advertising layouts, fashion drawings, product drawings, and display and package designs for the advertising field. The production artist's task is to prepare art for printing and photographic reproduction.

Programs and courses are offered in Columbus, Evansville, Sellersburg, and South Bend. In addition, selected courses are available in Elkhart.

A two-year program, requiring 105 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (51 Credits)

Course #	Course Title	Credits
1810	Composition and Design Fundamentals	2
1812	Basic Drawing Fundamentals	2
1814	Basic Drawing Techniques 1	2
1815	Composition and Design Techniques 1	2
1816	Illustration Techniques 1	2
1820	Composition and Design Techniques 2	2
1822	Basic Drawing Techniques 2	2
1824	Typography Techniques	2
1825	Creative Typography	3
1830	Typographic Theory	3
1831	Black & White Illustration	2
1834	Black & White Media Techniques	2
1840	Layout Design Fundamentals 1	2
1842	Layout Design Techniques 1	2
1847	Keylining Fundamentals 1	2
1850	Layout Design Fundamentals 2	2
1854	Layout Design Techniques 2	2
1858	Storyboard Techniques	2
1860	Keylining Techniques 1	2
1869	Darkroom Processes	2
1872	Keylining Techniques 2	2
1883	Specialized Layout Concepts	2
1884	Specialized Layout Techniques	2
1885	Portfolio Preparation 1	3

### GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8111	Business Communications	4
8113	Oral Communications	4
8401	Human Relations	4
8403	Psychology of Advertising	4

### REGIONALLY DETERMINED ELECTIVES (34 Credits)

Electives	34
Total Credits	105

## INTERIOR DESIGN TECHNOLOGY

The program includes courses in composition and design, color theory, art history, structural design, interior design, textiles, communications, and human relations. The program prepares students for initial employment or for upgrading skills required in current employment.

Interior designers create interior environments for proposed and existing structures. The selection of furniture, equipment and accessories is an integral part of the design process. A designer may work on residential or commercial interiors or in theatrical set design.

Programs and courses are offered in Evansville, Kokomo, and South Bend. In addition, selected courses are available in Anderson, Elkhart, and Muncie.

A two-year program, requiring 96 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (38 Credits)

Course #	Course Title	Credits
2010	Composition and Design 1	3
2013	Fundamentals of Structural Design 1	4
2020	Composition and Design 2	3
2021	Textiles 1	3
2022	Fundamentals of Interior Design 1	3
2023	Fundamentals of Structural Design 2	3
2031	Textiles 2	3
2032	Furniture Styles 1	3
2033	Furniture Styles 2	3
2050	Applied Interior Design 1	4
2052	Professional Practices	3
2053	Furniture Arrangements and Space Planning	3

### GENERAL EDUCATION COURSES (12 Credits)

Course #	Course Title	Credits
8110	Communications	4
8113	Oral Communications	4
8212	Business Mathematics	4

### REGIONALLY DETERMINED ELECTIVES (46 Credits)

Electives	46
Total Credits	96



## PRINTING TECHNOLOGY

The program includes courses in art and camera preparation, camera and dark-room fundamentals, layout and stripping flats, platemaking, offset presswork, composition, press troubleshooting, production control, special effects, and ink and paper selection for offset.

Programs and courses are offered in Terre Haute. In addition, selected courses are available in Columbus.

A two-year program, requiring 101 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (63 Credits)

Course #	Course Title	Credits
2210	Type Composition for Reproduction	2
2211	Art and Copy Preparation	2
2212	Layout and Stripping Flats	2
2213	General Printing Process	2
2214	Camera Fundamentals	2
2215	Plate Making Fundamentals	2
2216	Offset Presswork Fundamentals	3
2221	Camera-Line and Halftone	2
2222	Stripping Line and Halftone Negative	2
2223	Photo Offset Fundamentals	2
2224	Printing Estimating	3
2225	Offset Presswork 1	3
2231	Advanced Camera	2
2232	Offset Presswork Operations	2
2233	Offset Presswork 2	3
2240	Special Effect Camera Work	2
2241	Printing Production Practice	2
2242	Press Troubleshooting	2
2243	Offset Presswork 3	3
2244	Ink and Paper for Offset	2
2251	Special Problems in Offset Preparation	3
2252	Manufacturing and Organization	3
2255	Printing Specialization	4
2262	Production Controls	3
2263	Introduction to Photo Typesetting	3
2264	Preventive Maintenance	2

### GENERAL EDUCATION COURSES (21 Credits)

Course #	Course Title	Credits
8110	Communications	4
8113	Oral Communications	4
8114	Technical Reporting	3
8201	Applied Mathematics 1	4
8401	Human Relations	4
8406	Employment Orientation	2

### REGIONALLY DETERMINED ELECTIVES (17 Credits)

Electives	17
Total Credits	101

## LIBRARY RESOURCE AIDE

The library resource aide supports and assists the professional librarian in library circulation, reference, technical processes, audiovisual preparations, children's services, clerical duties, and related areas. The program includes courses in library forms and records, typing, library technical services, AV productions, communications and office procedures. The program may also provide for a field project in a cooperating library.

Programs and courses are available in Indianapolis.

A one-year program, requiring 45 credits, leads to a Technical Certificate. Also offered is a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (24 Credits)

Course #	Course Title	Credits
2415	Audiovisual Equipment Operation and Maint.	3
2417	Library and LRC Fundamentals 1	3
2418	Library and LRC Fundamentals 2	3
2419	Library Forms and Records	3
2427	Library Operations and Practices	5
8501	Field Study/Coop Ed	7

### GENERAL EDUCATION COURSES (8 Credits)

Course #	Course Title	Credits
8110	Communications	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (13 Credits)

Electives	13
Total Credits	<u>45</u>

# HEALTH OCCUPATIONS DIVISION

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The Health Occupations Division recognizes the increasing employment opportunities in the expanding health field. Ivy Tech prepares students to become technically trained members of the health care team. Classroom, laboratory, and clinical training prepare students for service in hospitals, laboratories, nursing homes, child care facilities, doctors' offices, and other health care-related settings.

College health occupation programs are recognized and accredited by appropriate external accrediting agencies. The student is advised to contact the nearest center for information concerning programs and course offerings.

## **CHILD CARE**

The program focuses on early childhood growth and development and on parent-child relations. Emphasis is placed on the skillful handling of groups of young children. The student also observes and participates in parent groups. Instruction is provided in music, art, storytelling, and language development. Other courses include nutrition, first aid, recreation, and audiovisual materials. Through field experiences the student may progress from the level of observer to that of supervised student/assistant teacher.

Programs and courses are offered in Fort Wayne, Muncie, and Richmond. In addition, selected courses are available in Angola, Berne, Bluffton, Columbia City, Columbus, Huntington, Indianapolis, Kendallville, Kokomo, and Logansport.

A two-year program, requiring 98 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupa-

tional Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

#### TECHNICAL COURSES (86 Credits)

Course #	Course Title	Credits
0323	Business Principles and Organization	3
2601	Introduction to Child Care	4
2610	Child Growth and Development	4
2612	Childhood Health	3
2623	Cognitive and Creative Activities	3
2624	Child Care Participation 1	4
2625	Legal Aspects of Child Care	3
2626	Science & Social Studies for Preschool Children	4
2627	Child Care Seminar 1	2
2631	Child Care Participation 2	4
2633	Community Resources	4
2637	Child Care Seminar 2	2
2642	Nutrition and Meal Planning	4
2643	Preschool Art	4
2645	Child Care Participation 3	4
2647	Child Care Seminar 3	2
2651	Language Arts for Children	4
2654	Child Care Participation 4	4
2655	Bookkeeping	4
2657	Child Care Seminar 4	2
2660	Preschool Music	4
2661	Management Techniques	4
2663	Audiovisual Materials and Methods	4
2665	Child Care Participation 5	4
2667	Child Care Seminar 5	2

#### GENERAL EDUCATION COURSES (8 Credits)

Course #	Course Title	Credits
8110	Communications	4
8401	Human Relations	4

#### REGIONALLY DETERMINED ELECTIVES (4 Credits)

Electives	4
Total Credits	<u>98</u>

## MENTAL HEALTH REHABILITATION

The program trains technicians in activity therapy, work therapy, supportive psychotherapy, and educational and recreational programs. The curriculum offers specialized and technical courses in physical and behavioral client treatment techniques, management of client living units, recreational and creative activities, and client assessment and documentation.

The program provides employment skills for those interested in paraprofessional work in the mental health field.

Programs and courses are offered in Fort Wayne, Muncie, and New Castle. In addition, selected courses are available in Anderson, Angola, Berne, Bluffton, Columbia City, Huntington, Indianapolis, Kendallville, and Richmond.

A two-year program, requiring 105 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (79 Credits)

Course #	Course Title	Credits
2701	Physical Care	4
2702	Behavior Management 1	4
2704	Introduction to Human Services	3
2710	Clinical 1	5
2711	Physical Systems 1	4
2712	Behavior Management 2	4
2713	Human Growth and Development 1	4
2714	Human Growth and Development 2	4
2715	Evaluation and Assessment	2
2716	Information Management	2
2717	Special Populations	3
2720	Clinical II	5
2730	Clinical III	5
2733	Current Issues in Mental Health	3
2734	Residential Management	4
2743	Legal Aspects	4
2760	Therapeutic Recreation	4
2762	Service Delivery Systems	3
2775	Supervision	4
3766	First Aid	3
9310	Pharmacology	4
9359	Cardiopulmonary Resuscitation	1

### GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8201	Applied Math I	4
8401	Human Relations	4
8402	Applied Behavioral Psychology	4
8452	Abnormal Psychology	4

### REGIONALLY DETERMINED ELECTIVES (6 Credits)

Electives	6
Total Credits	105

## MEDICAL LABORATORY TECHNICIAN

Medical laboratory technicians (MLTs) perform laboratory procedures, define and solve associated problems, and use quality control techniques that aid in the diagnosis, treatment, and monitoring of patients. Courses in bacteriology, parasitology, chemistry, hematology, immunology, anatomy, physiology, and immunohematology provide both theory and practical applications.

Ivy Tech's program is approved by the National Accrediting Agency for Clinical Laboratory Sciences. Graduates are eligible to take one of the national registries for designation as MLT or CLT.

Programs and courses are offered in Indianapolis, Lafayette, Richmond, South Bend, and Terre Haute.

A two-year program, requiring 97 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate (Richmond Center) and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (55 Credits)

Course #	Course Title	Credits
2811	Fundamentals of Laboratory Techniques	4
2813	Immunohematology Techniques	4
2814	Routine Analysis Techniques	4
2820	Hematology Techniques	8
2823	Microbiology Techniques	6
2829	Parasitology and Mycology	2
2830	Chemistry Techniques	8
2832	Immunology Techniques	4
2860	Advanced Chemistry Techniques	2
2863	Instrumentation	3
9349	Anatomy and Physiology	8
9350	Medical Law and Ethics	2

### GENERAL EDUCATION COURSES (11 Credits)

Course #	Course Title	Credits
8110	Communications	4
8307	General Chemistry	3
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (31 Credits)

Electives

	31
Total Credits	<u>97</u>

## DENTAL ASSISTANT

The program includes courses in dental anatomy and physiology, microbiology, pharmacology, oral pathology, dental materials, chairside assisting, record keeping, and typing. A large portion of the student's time is spent in clinical and laboratory work.

Dental Assistants work with dentists as they examine and treat patients. They make patients comfortable in the dental chair, prepare them for treatment, and assist at chairside. Dental assistants also prepare materials for making impressions and restorations, expose radiographs, and process X-ray film as directed by the dentist. Many assistants provide oral health instruction and prepare instruments for sterilization.

Programs and courses are offered in Lafayette and Muncie.

A one-year program, requiring 78 credits, leads to a Technical Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (74 Credits)

Course #	Course Title	Credits
1212	Typewriting 1	4
3001	Introduction to Dental Practice and Ethics	2
3003	Dental Materials and Laboratory 1	4
3007	Preclinical Practice 1	5
3008	Dental Anatomy	4
3009	Health Office Communications	4
3010	Dental Materials and Laboratory 2	4
3011	Preclinical Practice 2	5
3012	Oral Pathology/ Microbiology	4
3013	Preventive Dentistry/ Diet and Nutrition	3
3034	Dental Radiography	5
3038	Clinical Practice 1	2
3039	Dental Office Management	4
3042	First Aid for Dental Assistant	4
3044	Clinical Practice 2	11
3045	Pharmacology for Dental Assistant	1
9349	Anatomy and Physiology	8

### GENERAL EDUCATION COURSES (4 Credits)

Course #	Course Title	Credits
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES ( Credits)

Electives

	<u>4</u>
Total Credits	78

## FOOD SERVICE TECHNOLOGY

The program prepares students for careers in regional or national food chains or in health care facilities and institutions. Students are trained to select, purchase, prepare, and produce food in quantity. Included are courses in volume purchasing and preparation of foods and supervision of food service operations.

Programs and courses are offered in Richmond.

A one-year program, requiring 48 credits, leads to a Technical Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (33 Credits)

Course #	Course Title	Credits
2901	Introduction to Food Preparation	4
2902	Beverage Management	2
2903	Marketing in Food Service	3
2904	Restaurant Supervisor	4
3414	Introduction to Volume Food Service	4
3422	Volume Food Preparation	4
3451	Introduction to Food Service	3
3452	Food Service I	3
3457	Purchasing Procedures	3
3460	Equipment Technology	3

### GENERAL EDUCATION COURSES (12 Credits)

Course #	Course Title	Credits
8110	Communications	4
8212	Business Mathematics	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (3 Credits)

Electives

	<u>3</u>
Total Credits	48



## DIETARY ASSISTANT

The program prepares the student for initial employment in the food service field. Included are courses in nutrition, diet therapy, personnel management, sanitation, cost control, and food preparation. Opportunity for practical experience under the supervision of a registered dietician is provided. The program meets the requirements of the American Dietetic Association and the Indiana State Board of Health. Programs and courses are offered in Fort Wayne, Gary, South Bend, and Westville. In addition, selected courses are available in Warsaw.

A one-quarter program, requiring 16 credits, leads to the Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (16 Credits)

Course #	Course Title	Credits
3607	Nutrition and Diet Therapy	5
3608	Dietary Management 1	5
3609	Dietary Management 2	5
3612	Nutrition Diet Therapy - Practicum	1
Total Credits		16

## MEDICAL ASSISTANT

This program is accredited by the American Association of Medical Assistants and the American Medical Association. Graduates may sit for the National Certification Examination. The curriculum includes training in medical terminology, medical office procedures, medical typing, medical insurance, medical transcription, and anatomy and physiology. Externships are required in the clinical and administrative areas.

Programs and courses are offered in Columbus, Fort Wayne, Evansville, Gary, Indianapolis, Jeffersonville, Kokomo, Lafayette, Madison, Muncie, South Bend, Terre Haute, and Westville. In addition, selected courses are available in Angola, Berne, Bluffton, Boonville, Columbia City, Crane, Huntington, Kendallville, Lawrenceburg, Logansport, Mount Vernon, Princeton, Richmond, Tell City, Valparaiso, and Washington.

A two-year program, requiring 101 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (85 Credits)

Course #	Course Title	Credits
3712	Medical Office Procedures Clinical 1	4
3713	Medical Office Bookkeeping	4
3719	Medical Typewriting	3
3721	Medical Office Procedures Administrative	4
3729	Medical Assistant Clinical Externship	4
3730	Medical Assistant Laboratory Techniques	4
3732	Medical Office Communications	4
3742	Medical Office Procedures Clinical 2	4
3743	Machine Transcription Medical 1	3
3744	Machine Transcription Medical 2	3
3752	Medical Office Procedures Clinical 3	4
3761	Community Health	2
3763	Medical Office Management	3
3766	First Aid and Emergency Care	3
3769	Medical Assistant Administrative Externship	4
3771	Medical Insurance	3
4406	Holistic Approach to Health	2
9310	Pharmacology	4
9349	Anatomy & Physiology	8
9350	Medical Law & Ethics	2
9355	Medical Terminology	4
9356	Disease Conditions	6
9359	Cardiopulmonary Resuscitation	1

### GENERAL EDUCATION COURSES (7 Credits)

Course #	Course Title	Credits
8111	Business Communications	4
8308	General Microbiology	3

### REGIONALLY DETERMINED ELECTIVES (9 Credits)

Electives

	9
Total Credits	101

## HUMAN SERVICES

The program prepares students to work as paraprofessionals in various social, community, and educational service agencies. The paraprofessional utilizes a knowledge of human behavior, group dynamics, and psychosocial processes to work effectively with specific populations. Human services are, in a broad sense, a part of education; developmental disabilities services; mental health, recreation, and child care programs; services for the elderly; alcohol and drug rehabilitation programs; criminal justice and correctional programs, and nonprofit organizations.

The program provides extensive field experiences in addition to classroom studies in the areas of child care and care of the elderly. Courses include child growth and development, human services, childhood movements and creative activity, group leadership and group process, techniques of client treatment, psychology of aging and death, recreational programming for the elderly, and community resources.

The program is offered in Indianapolis.

A two-year program, requiring 90 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (47 Credits)

Course #	Course Title	Credits
2633	Community Resources	2
4005	Motivation and Learning	4
4010	Human Services 1	4
4020	Human Services 2	3
4032	Helping Relationship Techniques	4
4034	Interviewing and Counseling	4
4041	Directed Practice 1	6
4050	Group Process and Skills	4
4051	Directed Practice 2	4
4060	Program Planning and Evaluation	4
4061	Directed Practice 3	4
4065	Human Services Topical Seminar	4

### GENERAL EDUCATION COURSES (23 Credits)

Course #	Course Title	Credits
8110	Communications	4
8113	Oral Communications	4
8117	Effective Listening	2
8401	Human Relations	4
8402	Applied Behavioral Psychology	4
8405	Social Problems	4
9359	Cardiopulmonary Resuscitation	1

### RESTRICTED ELECTIVES (20 Credits)

Electives	20
Total Credits	90

## SURGICAL TECHNOLOGY

The program offers courses in surgical techniques, anatomy and physiology, pharmacology, microbiology, medical law and ethics, and clinical and surgical procedures. Part of the program is taught in a hospital setting. Graduates are eligible to become certified surgical technologists.

Programs and courses are offered in Gary, Indianapolis, Lafayette, and Westville. In addition, selected courses are available in Sellersburg.

A one-year program, requiring 75 credits, leads to a Technical Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings

### TECHNICAL COURSES (66 Credits)

Course #	Course Title	Credits
4211	Surgical Techniques 1	10
4221	Surgical Procedures 1	5
4222	Clinical Applications 1	7
4230	Surgical Procedures 2	5
4231	Clinical Applications 2	10
4240	Clinical Applications 3	10
4242	Surgical Procedures 3	4
9349	Anatomy & Physiology	8
9350	Medical Law & Ethics	2
9355	Medical Terminology	2
9358	Pharmacology	3

### GENERAL EDUCATION COURSES (3 Credits)

Course #	Course Title	Credits
8308	General Microbiology	3

### REGIONALLY DETERMINED ELECTIVES (6 Credits)

Electives	3
Total Credits	<u>75</u>

## NURSING

Ivy Tech offers two levels of nurse training -- the Practical Nurse (PN) program and the Associate Degree Nursing program (ADN). The two programs are based on the career ladder concept, whereby a student completes the PN program, works for a period of time, then enrolls for further training at the Associate Degree level.

### PRACTICAL NURSING (PN) Program

Graduates of the PN program are eligible to take the state examination to become licensed as practical nurses. The one-year program, requiring 74 credits, leads to a Technical Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

PN programs and courses are available in Bloomington, Columbus, Fort Wayne, Gary, Indianapolis, Jeffersonville, Lafayette, Madison, Muncie, New Castle, Richmond, South Bend, Terre Haute, and Westville.

### PRACTICAL NURSING (PN) Program

#### TECHNICAL COURSES (74 Credits)

Course #	Course Title	Credits
4401	Foundations of Nursing	3
4402	Collecting, Reporting and Recording Patient Data	3
4403	Therapeutic Measures	6
4406	Holistic Approach to Health	2
4407	Nutrition	2
4408	Oncologic Nursing	1
4412	Endocrine Nursing	2
4415	Cardiovascular Nursing	2
4416	Gastrointestinal Nursing	2
4419	Respiratory Nursing	2
4423	Medical Surgical Clinical Nursing 1	7
4425	Musculoskeletal & Neurological Nursing 2	2
4426	Genitourinary Nursing	2
4432	Medical Surgical Clinical Nursing 2	7
4434	Intravenous Therapy	2
4437	Dermatologic & E.E.N.T. Nursing	1
4438	Gerontology	2
4439	Geriatric Clinical Nursing	2
4440	Maternal Health Nursing	3
4442	Maternal Clinical Nursing	2
4449	Practical Nurse in Today's Society	2
4453	Pediatric Nursing	3
4454	Pediatric Clinical Nursing	2
9310	Pharmacology	4
9349	Anatomy and Physiology	8
Total Credits		74

## ASSOCIATE DEGREE NURSING (ADN) Program

Graduates of the PN program who have accrued 2,000 hours of work experience in their field may enroll in the two-year ADN program. The ADN program, which leads to an Associate Degree in Applied Science, requires 47 credits in addition to those earned on the PN level. Graduates of the ADN program are eligible to take the state examination to become registered nurses. ADN programs and courses are offered in Lafayette, Richmond, Sellersburg, and South Bend. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### Credits

	<b>Credits</b>
TECHNICAL COURSES	38
GENERAL EDUCATION COURSES	<u>9</u>
Total Credits	47

## RADIOLOGIC TECHNOLOGY

This program, certified by the national accrediting agency, includes courses in nursing procedures for X-ray technologists, anatomy and physiology, medical terminology, and medical law and ethics, in addition to the extensive clinical training required with an affiliated hospital. Upon completion of the program, graduates are eligible to take the national certification examination.

Programs are offered in Indianapolis and Terre Haute.

A two-year program, requiring 109 credits, leads to an Associate Degree in Applied Science. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (76 Credits)

Course #	Course Title	Credits
4609	Nursing Procedures for X-Ray Technicians	2
4613	Radiation Physics 1	3
4620	Orientation to X-Ray Technology	4
4624	Radiographic Positioning 1	3
4625	Principles of Radiographic Exposures 1	3
4633	Radiographic Positioning 2	2
4634	Principles of Radiographic Exposures 2	3
4642	Imaging Techniques	3
4643	Radiographic Positioning 3	3
4650	Radiographic Positioning 4	3
4655	X-Ray Clinical Education 4	6
4661	Special Procedures	3
4668	X-Ray Clinical Education 5	6
4672	Radiobiology	3
4678	X-Ray Clinical Education 6	6
4685	General Examination Review	4
4688	X-Ray Clinical Education 7	6
4699	Radiologic Quality Assurance	3
9349	Anatomy and Physiology	8
9350	Medical Law and Ethics	2

### GENERAL EDUCATION COURSES (5 credits)

Course #	Course Title	Credits
9305	Technical Mathematics for Health Occupations	5

### REGIONALLY DETERMINED ELECTIVES (28 Credits)

Electives		<u>28</u>
Total Credits		109

## RESPIRATORY THERAPY TECHNOLOGY

The program trains technicians to treat patients with cardiorespiratory problems. Included are courses in anatomy and physiology, respiratory therapy science, cardiopulmonary physiology, and nursing techniques. Cooperating hospitals and clinics provide clinical experience under the supervision of a physician and respiratory therapist. Graduates of the program may take the national examination for certification as respiratory therapy technicians.

Programs and courses are offered in Bloomington, Fort Wayne, Gary, Indianapolis, Lafayette, Westville. In addition, selected courses are available in Angola, Berne, Bluffton, Columbia City, Huntington, and Kendallville.

A two-year program, requiring 112 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (95 Credits)

Course #	Course Title	Credits
4810	Basic Science	4
4812	Respiratory Therapy Science 1	6
4813	Nursing Techniques	3
4820	Cardiopulmonary Physiology	4
4821	Respiratory Therapy Science 2	6
4822	Respiratory Therapy Applications 1	5
4823	Clinical Practicum 1	4
4830	Laboratory Data	3
4831	Clinical Medicine	4
4832	Respiratory Therapy Applications 2	5
4833	Clinical Practicum 2	8
4848	Advanced Cardiopulmonary - Renal Physiology	6
4849	Management Techniques for Respiratory Therapy	3
4850	Therapist Clinic 1	7
4851	Therapist Clinic 2	12
4852	Critical Respiratory Care	6
9322	Biophysics for Health Occupations	2
9353	Anatomy and Physiology 1	4
9358	Pharmacology	3

### GENERAL EDUCATION COURSES (17 Credits)

Course #	Course Title	Credits
8112	Technical Communications	3
8203	Technical Mathematics	4
8307	General Chemistry	3
8308	General Microbiology	3
8401	Human Relations	4
Total Credits		112



# TRADE AND TECHNICAL DIVISION

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The Trade and Technical Division provides broad, practical training for those seeking employment and advancement in the trade and technical occupations. The programs emphasize the ability to think and plan in the job setting. Initial laboratory experiences develop skills in the use of modern industrial equipment and measuring instruments. Later classroom and laboratory work provide training in analysis, construction, and theory of industrial application and design. Each program provides opportunities for the student to advance from basic skills to proficiency on a high technological level.

Program advisory committees, composed of experts in each area of industry, serve the important function of keeping the content of the programs current with changes in technology. Ivy Tech's programs and courses are designed to meet the needs of local industries. The practical value of the coursework is substantiated by its use in the training programs of many local industries.

## AGRICULTURAL EQUIPMENT

The program trains technicians to sell, service, maintain, and repair on- and off-farm agricultural equipment, including diesel and gas-powered tractors. Technicians are also trained in preventative maintenance, including testing, adjusting, cleaning, and tuning engines. Courses are offered in general farm equipment, diesel and other engines, theory and design, service and parts department management, transmission systems, and air conditioning. Required related courses in math and communications supplement the technical training.

Programs and courses are offered in Indianapolis and Lafayette. In addition, selected courses are available in Attica, Crawfordsville, Delphi, Fowler, Frankfort, Gary, Kokomo, Monticello and South Bend.

A two-year program, requiring 92 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (25 Credits)

Course #	Course Title	Credits
5115	Hydraulic Fundamentals	3
5123	Diesel Engines 1	3
5124	Manual Transmissions	3
5125	Open Center Hydraulic Systems	3
5126	Closed Center Hydraulic Systems	3
5127	Hydraulic Assist Transmissions	3
5132	Diesel Engines 2	3
5133	Environmental Control	4

### GENERAL EDUCATION COURSES (12 Credits)

Course #	Course Title	Credits
8110	Communications	4
8201	Applied Mathematics 1	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (55 Credits)

Electives	55
Total Credits	92

## APPLIED FIRE SCIENCE

The program introduces the student to fire technology, offering technical training in fire apparatus, fire fighting strategy and tactics, investigations, and prevention. Fire service organization and management courses are available for training in administration. Additional courses in human relations, communications, and psychology prepare graduates for public speaking assignments and other civic responsibilities.

Programs and courses are offered in Fort Wayne and Gary. Selected courses are available in Angola, Berne, Bluffton, Chesterton, Columbia City, East Chicago, Evansville, Hammond, Huntington, Kendallville, Kokomo, Michigan City, Munster, Richmond, St. John, Sellersburg, and South Bend.

A two-year program, requiring 92 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term occupational certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (54 Credits)

Course #	Course Title	Credits
0913	Techniques of Supervision 1	3
5313	Introduction to Fire Technology	3
5314	Fire Apparatus 1	3
5323	Fire Apparatus 2	3
5324	Fire Department Hydraulics 1	3
5332	Fire Fighting Strategy and Tactics 1	3
5333	Fire Alarm and Protection Equipment	3
5334	Fire Fighting Strategy and Tactics 2	2
5342	Hazardous Materials 1	3
5343	Rescue Practices and Procedures	3
5350	Applied Chemistry	2
5352	Hazardous Materials 2	3
5353	Fire Investigations	4
5360	Fire Service Inspection	4
5362	Fire Department Specifications	4
5363	Fire Prevention	4
5364	Legal Problems in Fire Service	4

### GENERAL EDUCATION COURSES (22 Credits)

Course #	Course Title	Credits
8110	Communications	4
8114	Technical Reporting	3
8203	Technical Mathematics 1	4
8307	General Chemistry	3
8401	Human Relations	4
8402	Applied Behavioral Psychology	4

### REGIONALLY DETERMINED ELECTIVES (16 Credits)

Electives

	<u>16</u>
Total Credits	92

## ARCHITECTURAL DRAFTING

The program provides extensive drafting experience and a working knowledge of building materials, mechanical and electrical equipment, estimating, surveying, and rendering. Computer-aided design (CAD) equipment provides hands-on experience in the new computer graphics specialty.

The program trains personnel for positions in the residential and commercial building industry. The curriculum includes courses in drafting fundamentals, laboratory projects, mathematics, and communications.

Programs and courses are offered in Bloomington, Columbus, Fort Wayne, Indianapolis, Kokomo, Logansport, Sellersburg, South Bend, and Terre Haute. In addition, selected courses are available in Angola, Berne, Bluffton, Columbia City, Evansville, Gary, Greenfield, Grissom AFB, Huntington, Kendallville, Lafayette, Lebanon, Linton, Muncie, Richmond, and Westfield.

A two-year program, requiring 105 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (33 Credits)

Course #	Course Title	Credits
5430	Light Construction Presentation Drafting	3
5431	Light Construction Layout Drafting	3
5433	Light Construction Detail Drafting	3
5440	Medium Construction Presentation Drafting	3
5441	Medium Construction Layout Drafting	3
5442	Medium Construction Detail Drafting	3
5450	Heavy Construction Presentation Drafting	3
5451	Heavy Construction Layout Drafting	3
5453	Heavy Construction Detail Drafting	3
7510	Basic Drafting	3
7511	Intermediate Drafting	3

### GENERAL EDUCATION COURSES (18 Credits)

Course #	Course Title	Credits
8110	Communications	4
8203	Technical Mathematics 1	4
8208	Geometry	3
8209	Trigonometry	3
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (54 Credits)

Electives

	<u>54</u>
Total Credits	105

## SECURITY AND LOSS PREVENTION

The program prepares students for security careers in business, governmental agencies, and nonprofit institutions. Courses examine protective systems and alternatives, the correction system, concepts of criminality, psychological effects of the use of force, and alternatives to the use of firearms. The program also stresses the value of loss prevention in protecting and conserving assets.

The program is offered in Fort Wayne. Selected courses are available in Angola, Berne, Bluffton, Columbia City, Gary, Huntington, and Kendallville.

A one-quarter program, requiring 16 credits, leads to an Occupational certificate. The student is advised to contact the nearest center for information concerning specific courses or the program of study.

### TECHNICAL COURSES (16 Credits)

Course #	Course Title	Credits
5501	Introduction to Security	4
5514	Principles of Interviewing	4
5522	Safety and Fire Prevention	4
5530	Principles of Loss Prevention	4
Total Credits		16

## AUTOMOTIVE BODY REPAIR

The program trains students to become qualified body repair technicians. Courses are offered in body, frame, and chassis repair, collision damage, paint refinishing, fiberglass/plastics repair, sheet metal, and welding. The equipment used in the training laboratories, including the bench measuring and pulling systems used in precision alignment, represents the most up-to-date technology.

A one-year program, requiring 61 credits, leads to the Technical Certificate. A shorter-term program, leading to an Occupational Certificate, is also available. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

Programs and courses are offered in Fort Wayne, Gary, Indianapolis, Jeffersonville, Kokomo, Lafayette, Madison, Muncie, and Terre Haute. In addition, selected courses are available in Angola, Berne, Bluffton, Columbia City, Evansville, Huntington, Kendallville, and South Bend.

### TECHNICAL COURSES (22 Credits)

Course #	Course Title	Credits
5601	Basic Body Repair 1	2
5602	Basic Body Repair 2	2
5603	Basic Body Repair 3	2
5604	Basic Body Repair 4	2
5611	Collision Damage Repair 1	2
5612	Collision Damage Repair 2	2
5620	Frame and Chassis 1	2
5621	Frame and Chassis 2	2
5624	Auto Body Welding 1	2
5625	Auto Paint Shop Practice 1	2
5630	Collision Damage Appraising	2

### GENERAL EDUCATION COURSES (8 Credits)

Course #	Course Title	Credits
8201	Applied Mathematics 1	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (31 Credits)

Electives	<u>31</u>
Total Credits	61

## AUTOMOTIVE SERVICE

The program includes courses in chassis and suspension; front-end alignment; braking systems; conventional, electronic, and computerized ignition systems; carburetion and fuel injection systems; tuneup; manual and automatic transmissions; microprocessors; and air conditioning. Training simulators provide hands-on laboratory experience with computers, electronic ignition systems, and new types of braking systems, front suspension, and body construction.

Programs and courses are offered in Columbus, Evansville, Fort Wayne, Gary, Indianapolis, Jeffersonville, Kokomo, Lafayette, Lawrenceburg, Madison, Muncie, Richmond, Sellersburg, South Bend, Tell City, and Terre Haute. In addition, selected courses are also available in Angola, Berne, Bluffton, Boonville, Columbia City, Connersville, Crane, Crawfordsville, Frankfort, Grissom AFB, Huntington, Kendallville, Linton, Logansport, Mount Vernon, Princeton, Tell City, and Washington.

A two-year program in automotive service technology, requiring 105 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

A two-year optional program in automotive service diesel technology, requiring 107 credits, leads to an Associate Degree in Applied Science. The diesel option is offered at Indianapolis. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (57 Credits)

Course #	Course Title	Credits
5812	Automotive Chassis and Suspension	3
5813	Automotive Braking Systems	3
5814	Automotive Front End Alignment	3
5821	Engine Theory, Design and Construction	3
5822	Engine Tools and Equipment	3
5823	Basic Electricity	3
5825	Fuel and Carburetion - Theory & Circuits	3
5826	Fuel and Carburetion - Overhaul	3
5828	Electronic Ignition Systems	3
5832	Starting & Charging Systems - Testing	3
5834	Engine Overhaul	3
5835	Manual Transmission Overhaul	3
5843	Differential and Rear Axle Overhaul	3
5845	Advanced Tune-Up	3
5847	Air Conditioning - Theory, Service and Components	3
5848	Air Conditioning - Diagnosis & Repair	3
5852	Engine Tune-Up	3
5854	Automatic Transmission Theory & Operation	3
5862	Comprehensive Diagnosis & Procedures 1	3

### GENERAL EDUCATION COURSES (19 Credits)

Course #	Course Title	Credits
8110	Communications	4
8201	Applied Math 1	4
8202	Applied Math 2	4
8301	Physical Science	3
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (29 Credits)

Electives	29
Total Credits	105

## BUILDING CONSTRUCTION

The program trains students to become skilled technicians in the construction industry. The program is flexible, permitting the student to pursue a full course of study in one of several specialties: cabinetry, carpentry, electrical, masonry, or plumbing; or to take a course or two to update skills. Courses provide instruction in the use of tools and materials and in fundamentals of construction, heating, air conditioning, refrigeration, plumbing, electrical wiring, and blueprint reading. Additional elective courses are available in several areas of specialization.

Programs and courses are offered in Bloomington, Jeffersonville, Kokomo, Muncie, and Richmond. In addition, selected courses are available in Anderson, Evansville, Gary, Grissom AFB, Lafayette, Lebanon, Madison, Marion, New Castle, and South Bend.

A two-year program, requiring 105 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (42 Credits)

Course #	Course Title	Credits
6001	Carpentry Fundamentals	3
6002	Construction Tools & Skills	3
6003	Construction Materials	3
6004	Safety and First Aid	3
6011	Floor and Wall Layout and Construction	3
6012	Roof Construction	3
6013	Blueprint Reading 1	3
6014	Electrical Wiring Fundamentals	3
6015	Residential Wiring	3
6023	Blueprint Reading 2	3
6024	Plumbing Fundamentals	3
6036	Masonry and Concrete Fundamentals	3
7112	Heating Fundamentals	3
7123	Air Conditioning & Refrigeration Fundamentals	3

### GENERAL EDUCATION COURSES (22 Credits)

Course #	Course Title	Credits
0112	Accounting Principles for Non-Majors	4
0122	Business Law 1	3
0323	Business Principles and Organization	3
8110	Communications	4
8201	Applied Mathematics 1	4
8401	Human Relations	4

### CABINETRY Option (22 Credits)

Course #	Course Title	Credits
6058	Introduction to Woodworking	3
6059	Principles of Woodworking	3
6065	Cabinetry 1	3



6067	Cabinetry 2	3
6069	Millwork 1	3
6089	Advanced Projects in Cabinetry and Millwork	3
8202	Applied Mathematics 2	3

### **CARPENTRY Option (22 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
6021	Carpentry - Advanced Framing	3
6032	Exterior Trim	3
6033	Interior Trim	3
6034	Millwork	3
6047	Cabinetry	3
6056	Estimating & Specifications-Carpentry	3
8202	Applied Mathematics 2	4

### **ELECTRICAL Option (16 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
6020	Electrical Blueprint	3
6030	Electrical Estimating	3
6031	Electrical - Commercial Wiring	3
6048	Industrial Wiring	3
8202	Applied Mathematics 2	4

### **MASONRY Option (24 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
6026	Advanced Skills in Masonry	3
6027	Masonry Estimating and Specifications	3
6041	Special Problems in Masonry Construction	3
6045	Special Problems in Concrete	3
6050	Advanced Masonry and Design	3
6054	Electrical and Plumbing-Mechanical Installation	3
	Electives in Masonry	6

### **PLUMBING Option (19 Credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
6022	Plumbing - Design and Installation 1	3
6025	Plumbing Blueprint	3
6035	Plumbing Estimating	3
6049	Commercial Installations - Plumbing	3
8202	Applied Mathematics 2	4
	Electives in Plumbing	3

**REGIONALLY DETERMINED ELECTIVES (To bring total to 105 credits)**

## DIESEL POWER TECHNOLOGY

The program provides comprehensive instruction to prepare for entry into the diesel industry field. Included are courses in diesel fuel systems, diesel engine theory, tune-up, rebuild, diagnosis, reassembly and testing, and diesel electrical systems. Students acquire the skills needed to interpret technical manuals and warranties, fulfill specific customer requests, target diesel malfunctions, and keep abreast of current technical developments in the field.

Programs and courses are offered in Columbus, Evansville, New Albany, Plymouth, Sellersburg, and South Bend. In addition, selected courses are available in Boonville, Crane, Fort Wayne, Gary, Mount Vernon, Muncie, Princeton, Richmond, Tell City, Terre Haute, and Washington.

A two-year program, requiring 102 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate, and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (84 Credits)

Course #	Course Title	Credits
5865	Service Organization and Management	3
6216	Electrical Fundamentals	3
6217	Diesel Electrical Systems Overhaul	3
6218	Diesel Engine Reassembly and Testing	3
6223	Diesel Electrical Systems Testing	3
6227	Diesel Engine Disassembly and Inspection	3
6235	Diesel Engine Theory	3
6236	Fluid Power Fundamentals	4
6240	Diesel Engine Diagnosis	3
6243	Diesel Fuel Systems 1	3
6254	Diesel Engine Upper Rebuild	4
6255	Diesel Engine Lower Rebuild	3
6257	Diesel Component Rebuild	3
6258	Diesel Engine Tune-up	3
6259	Diesel Fuel Systems 2	4
6260	Diesel Fuel Pump Calibration	3
6261	Heavy Duty Clutches and Manual Transmissions	3
6262	Heavy Duty Drive Lines and Rear Axles	3
6263	Heavy Duty Brake Systems	3
6264	Heavy Chassis, Suspension, and Steering	3
6265	Heavy Duty Automatic Transmissions - Theory and Design	3
6266	In-Vehicle Service of Heavy Duty Automatic Transmissions	3
6267	Heavy Duty Automatic Transmissions - Bench Overhaul 1	3
6268	Heavy Duty Automatic Transmissions - Bench Overhaul 2	3
6269	Advanced Fluid Power	3
6270	Mobile Air Conditioning & Refrigeration Theory and Service	3
6271	Mobile Air Conditioning & Refrigeration Diagnosis and Repair	3

### GENERAL EDUCATION COURSES (15 Credits)

Course #	Course Title	Credits
8110	Communications	4
8201	Applied Mathematics 1	4
8301	Physical Science	3
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (3 Credits)

Electives

	3
Total Credits	102

## ELECTRONICS TECHNOLOGY

(General, Industrial, Communications, Biomedical, Digital Computer, and Instrumentation options)

Six options are available to the student in the Electronics Technology program. The general option prepares the student for a wide range of technical positions in the electronics field. The specialty options provide training in specific technological areas of electronics. Microprocessors and robot trainers offer the most up-to-date training. The program prepares students for the federal and state licensing examinations as well as for immediate employment and upgrading of skills.

Programs and courses are offered in Anderson, Bloomington, Columbus, Connersville, Crane, Evansville, Fort Wayne, Gary, Hammond, Indianapolis, Jeffersonville, Kokomo, Lafayette, Logansport, Madison, Muncie, New Castle, Richmond, Sellersburg, South Bend, and Terre Haute. In addition, selected courses are available in Angola, Berne, Bluffton, Boonville, Columbia City, Connersville, Crawfordsville, Delphi, Huntington, Kendallville, Linton, Marion, Monticello, Mount Vernon, Princeton, Warsaw, and Washington.

A two-year program, requiring 105 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate, and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

The electronics and general education courses listed below are to be included in all electronics programs, regardless of option. To complete the major, the student must also take the courses listed under one of the electronics specialty programs identified as options.

### ELECTRONICS TECHNOLOGY - Common Core Curriculum

#### TECHNICAL COURSES (30 Credits)

Course #	Course Title	Credits
6434	Introduction to Active Devices	3
6435	Electronics Circuits 1	3
6446	Integrated Circuits	3
6447	Special Semiconductors	3
6470	AC Fundamentals	6
6471	DC Fundamentals	6
6562	Digital Principles 1	3
6563	Digital Principles 2	3

#### GENERAL EDUCATION COURSES (19 Credits)

Course #	Course Title	Credits
8110	Communications	4
8203	Technical Mathematics 1	4
8204	Technical Mathematics 2	4
8209	Trigonometry	3
8401	Human Relations	4

## ELECTRONICS TECHNOLOGY - GENERAL Option

The General option provides broad technological training in electronics for the student who does not wish to specialize. Many manufacturing and service industries prefer an employee with a more general electronics background. The program prepares the student for a wide variety of technical positions, enabling him/her to change fields more easily as the job market changes.

### TECHNICAL COURSES (57 Credits)

Course #	Course Title	Credits
	Common Core	30
6454	Electronics Circuits 2	3
6455	Circuit Analysis	3
6538	Rotating Machines 1	3
6539	Rotating Machines 2	3
6544	Introduction to Industrial Controls	3
6553	Industrial Electronics 1	3
6554	Industrial Electronics 2	3
6577	Digital Principles 3	3
6578	Digital Applications	3

### GENERAL EDUCATION COURSES (19 Credits)

Course #	Course Title	Credits
8110	Communications	4
8203	Technical Mathematics 1	4
8204	Technical Mathematics 2	4
8209	Trigonometry	3
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (29 Credits)

Electives	<u>29</u>
Total Credits	105

## ELECTRONICS TECHNOLOGY - INDUSTRIAL Option

The electronics option prepares technicians to troubleshoot electronic equipment, to perform operations and calculations, and to test and report.

### TECHNICAL COURSES (57 Credits)

Course #	Course Title	Credits
	Common Core	30
6454	Electronics Circuits 2	3
6455	Circuit Analysis	3
6538	Rotating Machines 1	3
6539	Rotating Machines 2	3
6544	Introduction to Industrial Controls	3
6553	Industrial Electronics 1	3
6554	Industrial Electronics 2	3
6577	Digital Principles 3	3
6578	Digital Applications	3

## GENERAL EDUCATION COURSES (19 Credits)

Course #	Course Title	Credits
	Common Core	19

## REGIONALLY DETERMINED ELECTIVES (29 Credits)

Electives	29
Total Credits	105

**ELECTRONICS TECHNOLOGY - COMMUNICATIONS Option**

The communications option trains the technician to operate, maintain, research, and construct communications equipment, including television, radio, radar, sonar, computer, spacecraft, and control instruments.

## TECHNICAL COURSES (48 Credits)

Course #	Course Title	Credits
	Common Core	30
6436	AM Radio	3
6438	FM Radio	3
6445	Monochrome Television	3
6448	Color Television	3
6450	Television Troubleshooting	3
6451	Communications Electronics 1	3

## GENERAL EDUCATION COURSES (19 Credits)

Course #	Course Title	Credits
	Common Core	19

## REGIONALLY DETERMINED ELECTIVES (38 Credits)

Electives	38
Total Credits	105

**ELECTRONICS TECHNOLOGY - BIOMEDICAL Option**

The biomedical option trains technicians to test, calibrate, and repair the complex biomedical equipment used in hospitals.

## TECHNICAL COURSES (82 Credits)

Course #	Course Title	Credits
	Common Core	30
6424	Troubleshooting Techniques	3
6436	AM Radio	3
6438	FM Radio	3
6454	Electronics Circuits 2	3
6455	Circuit Analysis	3
6525	Introduction to Test Equipment	3
6540	Medical Electronics 1	3
6541	Medical Electronics 2	3
6542	Medical Electronics 3	3
6553	Industrial Electronics 1	3
6577	Digital Principles 3	3

6578	Digital Applications	3
6583	Electrical Safety for Hospitals	4
9353	Anatomy & Physiology 1	4
9354	Anatomy & Physiology 2	4
9355	Medical Terminology	4

## GENERAL EDUCATION COURSES (22 Credits)

Course #	Course Title	Credits
	Common Core	19
8114	Technical Reporting	3

## REGIONALLY DETERMINED ELECTIVES (1 credit)

Electives	1
Total Credits	105

**ELECTRONICS TECHNOLOGY - DIGITAL COMPUTER Option**

The Data Process/Digital Computer option prepares technicians to to diagnose equipment problems, to repair and install equipment, and to interpret manuals, flow charts, and other data.

## TECHNICAL COURSES (57 Credits)

Course #	Course Title	Credits
	Common Core	30
6455	Circuits Analysis	3
6520	Microprocessors 1	3
6527	Peripherals 1	3
6533	Microprocessors 2	3
6535	Peripherals 2	3
6536	Programming	3
6547	Linear Integrated Circuits Applications	3
6577	Digital Principles 3	3
6578	Digital Applications	3

## GENERAL EDUCATION COURSES (19 Credits)

Course #	Course Title	Credits
	Common Core	19

## REGIONALLY DETERMINED ELECTIVES (29 Credits)

Electives	29
Total Credits	105

**ELECTRONICS TECHNOLOGY - INSTRUMENTATION Option**

The instrumentation option trains the technician to assist in the installation, maintenance, repair, and calibration of process control instruments and to troubleshoot simple process control systems.

## TECHNICAL COURSES (48 Credits)

Course #	Course Title	Credits
	Common Core	30
6550	Electromechanical Controls	3
7346	Industrial Instrumentation 1	3
7347	Industrial Instrumentation 2	3
7390	Instrumentation Calibrations	3
7391	Measurements and Calibrations	3
7392	Flow Measurements and Calibrations	3

## GENERAL EDUCATION COURSES (19 Credits)

Course #	Course Title	Credits
	Common Core	19

## REGIONALLY DETERMINED ELECTIVES (38 Credits)

Electives	<u>38</u>
Total Credits	105

## HEATING/AIR CONDITIONING/REFRIGERATION TECHNOLOGY

The program provides training in heat pump and cooling service, blueprint reading, electrical circuits and controls, duct fabrication and installation, heat loss and gain calculation, service organizations and management, and equipment sales.

Technicians in this field service and install residential, commercial, and industrial equipment; they also hold various sales and sales support positions. Students may choose to specialize in installation or in service (maintenance and repair). Some technicians work only with certain equipment, such as gas furnaces or commercial refrigerators; others service and install all types of equipment.

Programs and courses are offered in Bloomington, Columbus, Evansville, Fort Wayne, Gary, Indianapolis, Jeffersonville, Kokomo, Lafayette, Muncie, Richmond, Sellersburg, South Bend, Terre Haute, and Valparaiso. In addition, selected courses are available in Anderson, Angola, Berne, Bluffton, Boonville, Columbia City, Crane, Grisom Air Force Base, Hammond, Huntington, Kendallville, Linton, Logansport, Marion, Mount Vernon, New Castle, Princeton, Tell City, Warsaw, and Washington.

A two-year program, requiring 105 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate, and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (67 Credits)

Course #	Course Title	Credits
7112	Heating Fundamentals	3
7113	Basic Electricity for Air Conditioning	3
7114	Basic Mechanics & Shop Techniques	3
7123	Air Conditioning & Refrigeration Fundamentals	3
7124	Heating Service (Gas & Oil)	3
7125	Motors and Motor Control	3
7126	Air Conditioning & Refrigeration	3
7127	Heating Service (Electrical & Hydronic)	3
7133	Cooling Service Electrical	3
7134	Cooling Service Mechanical	3
7135	Electrical Circuits and Controls	3
7136	Psychrometrics	3
7137	Heat Loss and Gain Calculation	3
7143	Blueprint Reading	3
7144	Commercial Refrigeration	3
7145	Heat Pump Service	3
7153	Advanced Commercial Refrigeration	3
7154	Duct Fabrication and Installation	3
7155	Specifications and Estimating	3
7163	Air Distribution System Design	3
7165	Advanced Electrical Controls	3
7176	Applied Design	4

### GENERAL EDUCATION COURSES (16 Credits)

Course #	Course Title	Credits
8110	Communications	4
8201	Applied Mathematics 1	4
8202	Applied Mathematics 2	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (22 Credits)

Electives

	<b>22</b>
<b>Total Credits</b>	<b>105</b>



## INDUSTRIAL DRAFTING

The program provides training for industrial employment and for upgrading the skills of those already employed. Areas covered in the program include industrial processes and systems and several drafting areas, including tool, die, product design, gear and cam design, machine design, and jig and fixture design. The introduction of computer-aided design (CAD) equipment and courses offer hands-on experience in this new computer graphics specialty.

A two-year program, requiring 105 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate, and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

Programs and courses are offered in Bloomington, Columbus, Evansville, Fort Wayne, Gary, Indianapolis, Jeffersonville, Kokomo, Muncie, Sellersburg, South Bend, and Valparaiso. In addition, selected courses are available in Angola, Berne, Bluffton, Boonville, Columbia City, Crane, Crawfordsville, Fowler, Greenfield, Huntington, Kendallville, Lafayette, Lebanon, Linton, Logansport, Monticello, Mount Vernon, Princeton, Richmond, Terre Haute, Washington, and Westfield.

### TECHNICAL COURSES (27 Credits)

Course #	Course Title	Credits
7510	Basic Drafting	3
7511	Intermediate Drafting	3
7521	Industrial Processes and Systems	3
7522	Production Drawing	3
7530	Product Drafting 1	3
7532	Tool Drafting	3
7533	Die Design	3
7540	Product Design Drafting	3
7552	Strength of Materials	3

### GENERAL EDUCATION COURSES (18 Credits)

Course #	Course Title	Credits
8110	Communications	4
8203	Technical Mathematics 1	4
8208	Geometry	3
8209	Trigonometry	3
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (60 Credits)

Electives	60
Total Credits	105

## **INDUSTRIAL MAINTENANCE\***

The program trains people to maintain industrial facilities and equipment. The facility option trains students in the maintenance and repair of buildings and sites; the industrial option provides training in maintenance and repair of equipment used in industrial firms. Carpentry, electrical wiring, plumbing, heating and air conditioning, and welding courses are studied as they relate to facility repair. Machine tool, hydraulics, electrical wiring, electrical/electronic circuits, drafting, and welding courses are studied as they relate to equipment repair and maintenance.

Industrial maintenance people work in various capacities for building management firms, hotels, motels, apartment complexes, contractors, factories, manufacturing firms, and other service-oriented industries.

Programs and courses are offered in Evansville, Fort Wayne, Gary, Indianapolis, Jeffersonville, Lafayette, Muncie, Richmond, South Bend, Tell City, Terre Haute, and Valparaiso. In addition, selected courses are available in Anderson, Angola, Attica, Berne, Bluffton, Boonville, Columbia City, Columbus, Crane, Crawfordsville, Delphi, Fowler, Frankfort, Huntington, Kendallville, Kokomo, Madison, Marion, Monticello, Mount Vernon, New Castle, Princeton, Tell City, and Washington.

A two-year program, requiring 105 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate, and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

\*The Industrial Maintenance program is currently being revised. Please check with the Ivy Tech center nearest you for curriculum information.

## MINING TECHNOLOGY

The program offers on-the-job training as well as classroom study in coal operation and management. Courses include mining law, blasting and explosives, mine machinery, operations, reclamation mine planning, and economics of mining.

Mining jobs, ranging from apprentice levels to experienced machine operators, vary according to the type and method of mining.

The program is offered in Terre Haute. Selected courses are available in Muncie.

A two-year program, requiring 116 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate, and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (88 Credits)

Course #	Course Title	Credits
7341	Basic Hydraulics/Pneumatics Principles	3
7342	Hydraulics/Pneumatics Systems & Repair	3
7610	Introduction to Mining	5
7611	General Physical Geology	5
7612	Surface Mining Machinery	4
7621	Mine Maps and Surveying	3
7622	Mine Maps and Surveying Lab	2
7623	Elements of Reclamation	4
7631	Elements of Spoil Management	4
7632	Equipment Operations Lab 1	4
7633	Principles of Welding	4
7640	Blasting and Explosives	5
7641	Techniques of Operation Safety & Accident	4
7642	Electrical Circuits and Systems	4
7643	Economics of Mining & Cost Calculations	4
7650	Coal Preparations Plants	2
7651	Coal Sampling and Analysis	3
7652	Labor Relations	3
7653	Transmission Systems	4
7654	Mine Operational Planning	4
7660	First Aid and Safety Management	4
7662	Coal Mine Supervision	5
7663	Water Drainage and Water Pollution Laws	5

### GENERAL EDUCATION COURSES (23 Credits)

Course #	Course Title	Credits
8110	Communications	4
8113	Oral Communications	4
8203	Technical Mathematics 1	4
8208	Geometry	3
8209	Trigonometry	3
8222	Trigonometry 2	1
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (5 Credits)

Electives

	5
Total Credits	<u>116</u>

## MACHINE TOOL

The program provides training in many facets of the machine tool industry through work with machines and machine tools, including tool/cutter grinders, computer-controlled machines, and precision inspection equipment. Courses include machine tool fundamentals, theory, and applications; machine processing, setup, and operation; print reading; die making; heat treating; grinding; milling and drilling operations, and precision measurement. New training equipment, including computerized numerical controlled lathes, offers the most up-to-date methods of instruction.

Machine tool craftsmen maintain, set up, and operate tools at peak efficiency. The technician also plans and tests machines and tools for performance, durability, and efficiency, occasionally making recommendations for design changes to improve performance. The testing procedure includes recording data, making computations, plotting graphs, analyzing results, and writing reports.

Most machine tool technicians work in factories or small tool and die shops that produce machined metal products, transportation equipment, and machinery. Others work in production or maintenance departments or tool rooms.

Programs and courses are offered in Connersville, Evansville, Fort Wayne, Gary, Hammond, Indianapolis, Lafayette, Logansport, Muncie, Richmond, and South Bend. In addition, selected courses are available in Angola, Attica, Berne, Bluffton, Boonville, Columbia City, Columbus, Connersville, Crane, Huntington, Kendallville, Kokomo, Madison, Mount Vernon, Princeton, Sellersburg, Tell City, Terre Haute, Warsaw, and Washington.

A two-year program, requiring 105 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate, and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (30 Credits)

Course #	Course Title	Credits
7710	Basic Machine Tool Introduction	3
7711	Basic Machining Fundamentals	3
7712	Machining Fundamentals	3
7720	Machine Tool Processing	3
7721	Machine Tool Setup and Operation	3
7730	Advanced Machine Tool Processing	3
7731	Basic Print Reading	3
7733	Advanced Machine Tool Set-Up and Operation	3
7740	Specialized Machining Theory	3
7742	Specialized Machine Tool Application 1	3

### GENERAL EDUCATION COURSES (18 Credits)

Course #	Course Title	Credits
8110	Communications	4
8203	Technical Mathematics 1	4
8208	Geometry	3
8209	Trigonometry	3
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (57 Credits)

Electives	57
Total Credits	105

## PLASTICS MANUFACTURING

The program prepares skilled technicians for the plastics field. Training is offered in plastics materials, testing, and fabrication. Studies include various types of plastics; thermosetting and thermoplastic compounds; operation, setup, and maintenance of plastics machines; uses of plastics in production processes; injection and extrusion molding; product, mold, and tool design; quality control; print reading; electrical circuits; hydraulics; and pneumatics.

The program offers students the opportunity to develop skills in plastics technology while acquiring training in moldmaking and/or tool and die making. Thus, students in the plastics field acquire also a foundation in machine technology.

The program is available in South Bend.

A two-year program, requiring 90 credits, leads to the Associate in Applied Sciences Degree. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (33 Credits)

Course #	Course Title	Credits
0913	Techniques of Supervision 1	3
7331	Industrial Machines Electrical Circuits	3
7341	Basic Hydraulic & Pneumatic Principles	3
7731	Basic Print Reading	3
7801	Introduction to Plastics	3
7802	Plastic Extrusion	3
7803	Plastic Injection Molding	3
7804	Plastic Materials	3
7805	Low Pressure Tooling	3
7806	Thermoplastic Processes, General	3
7807	Plastic Quality Control	3

### GENERAL EDUCATION COURSES (20 Credits)

Course #	Course Title	Credits
8110	Communications	4
8113	Oral Communications	4
8201	Applied Mathematics 1	4
8202	Applied Mathematics 2	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (37 Credits)

Electives		37
Total Credits		<u>90</u>

## POLLUTION TREATMENT

The program provides training in wastewater treatment and air pollution control for municipal, industrial, and institutional occupations. Because of the diversity of Indiana's wastewater treatment facilities, the program offers, on a regional basis, courses, workshops, and seminars in several fields: wastewater treatment, water supply treatment, air pollution, solid wastes, toxic substances, water distribution, and hazardous materials. Specific courses include environmental control, water supply and treatment, equipment and maintenance, reporting and purchasing, community sanitation, air pollution, environmental administration and plant operations. The structure of the courses offers opportunities to upgrade skills, obtain training for initial employment, or complete requirements for the state licensing examinations.

Programs and courses are offered in Fort Wayne, Gary, Indianapolis, Sellersburg and Westville. In addition, selected courses are available in Columbus, Evansville, Grisom Air Force Base, Hammond, Kokomo, Lafayette, Logansport, Madison, Muncie, New Castle, Richmond, South Bend, Terre Haute, and Valparaiso.

A two-year program, requiring 96 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate, and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (34 Credits)

Course #	Course Title	Credits
7913	Introduction to Environmental Control	4
7915	Applied Chemistry 1	3
7934	Basic Hydraulics	4
7951	Reporting and Purchasing	2
7954	Plant Operations 1 (Municipal)	4
7955	Management and Supervision Procedures	3
7961	Plant Operations 2 (Municipal Advanced)	3
7963	Plant Operations 3 (Industrial)	3
7964	Plant Mathematics	4
7972	Environmental Administration	4

### GENERAL EDUCATION COURSES (27 Credits)

Course #	Course Title	Credits
8110	Communications	4
8113	Oral Communications	4
8114	Technical Report Writing	3
8203	Technical Mathematics 1	4
8204	Technical Mathematics 2	4
8301	Physical Science	3
8307	General Chemistry	3
8308	General Microbiology	3

**WASTEWATER MANAGEMENT Option (20 credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
7113	Basic Electricity	3
7125	Motor and Motor Control	3
7348	Millwright 1	4
7349	Millwright Shop 1	3
7350	Millwright 2	4
7351	Millwright Shop 2	3

**ENVIRONMENTAL CONTROL Option (14 credits)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
7916	Environmental Seminar	1
7943	Water Supply & Treatment	4
7957	Community Sanitation	3
7960	Air Pollution Control 1	4
7966	Hazardous Materials	2

**REGIONALLY DETERMINED ELECTIVES (15 Credits)**

Electives

	<u>15</u>
<b>Total Credits</b>	<b>96</b>

## WELDING

Several types of welding processes are covered in the program, including MIG, TIG, pipe-welding, oxyacetylene gas welding and cutting, and shielded metal arc welding. Other courses include interpretation of welding blueprints, electrical fundamentals for welding, metallurgy, and OSHA requirements.

Programs and courses are offered in Anderson, Evansville, Fort Wayne, Gary, Hammond, Indianapolis, Jeffersonville, Kokomo, Lafayette, Madison, Muncie, Richmond, Sellersburg, South Bend, Tell City, Terre Haute, and Valparaiso. In addition, selected courses are available in Angola, Berne, Bluffton, Boonville, Columbia City, Crane, Crawfordsville, Delphi, Fowler, Frankfort, Grissom AFB, Huntington, Kendallville, Logansport, Linton, Monticello, Mount Vernon, Princeton, Tell City, Warsaw, and Washington.

A two-year program, requiring 105 credits, leads to an Associate Degree in Applied Science. Also offered are a one-year Technical Certificate, requiring 66 credits, and a shorter-term Occupational Certificate. The student is advised to contact the nearest center for information concerning specific courses and program offerings.

### TECHNICAL COURSES (53 Credits)

Course #	Course Title	Credits
8013	Blueprint Interpretation	3
8024	Welding Blueprint Interpretation	3
8040	Welding Equipment Maintenance	3
8055	Special Welding Processes	4
8061	Pipe Welding 1	5
8063	Electrical Fundamentals for Welding	3
8064	Basic Metallurgy	3
8090	Shielded Metal Arc Welding 1	5
8095	Shielded Metal Arc Welding 2	5
8096	Gas Metal Arc (MIG) Welding	5
8097	Gas Tungsten Arc (TIG) Welding	5
8098	Welding Certification	4
8099	Oxyacetylene Gas Welding & Cutting	5

### GENERAL EDUCATION COURSES (16 Credits)

Course #	Course Title	Credits
8110	Communications	4
8201	Applied Mathematics 1	4
8202	Applied Mathematics 2	4
8401	Human Relations	4

### REGIONALLY DETERMINED ELECTIVES (36 Credits)

Electives	<u>36</u>
Total Credits	105



# COURSE DESCRIPTIONS

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## BUSINESS SCIENCES

### **0110 Accounting Principles I** 4

Introduces fundamental principles, techniques, and tools of accounting. Explains the mechanics of accounting, including the collection, summary, analysis, and reporting of information pertaining to service and mercantile enterprises.

### **0112 Accounting for Non-Majors** 4

Analyzes financial statements to determine levels of efficiency and company performance. Instructs in ratio and trend analysis, budgeting, capital expenditures, and price level effects on accounting.

### **0120 Accounting Principles II** 4

Studies payroll, automated accounting systems, internal control, notes and interest, departmental accounting, sales procedures, and valuation of receivables, inventories and fixed assets.

### **0122 Business Law I** 3

Studies the judicial system and the nature and sources of business law. Describes the nature of torts and crimes for which the law provides punishment, with emphasis on legal situations encountered in the performance or breach of contracts, in the creation of an agency, and in sales and negotiable instruments.

### **0124 Consumer Economics** 3

Includes study and review of cost of living and price levels, factors affecting consumer choices and buying practices, management of personal and family finances, the role of government in consumer protection, and current consumer problems.

- 0130 Accounting Principles III** 4  
 Develops accounting skills in journal and statement presentation of corporated capital stock, receivables, intangible assets, deferred charges, long-term liabilities, temporary investments, and long-term investments. Introduces branch operations accounting.
- 0131 Accounting III - Practicum** 1  
 Introduces principles of accounting as applied to various types of business. Emphasizes analysis, recording, summary, and financial reporting. Microcomputer software may be used in some regions.
- 0136 Introduction to Accounting for Government and Nonprofit Entities** 3  
 Introduces principles of fund accounting (governmental and nonprofit), accounting for and compliance with budgets, types of funds, and categories and groups of accounts.
- 0138 Computer Augmented Accounting** 4  
 Introduces either mainframe or microcomputer processing of financial data for business. Focuses on how computers receive, handle, store, retrieve, and print large amounts of data.
- 0140 Intermediate Accounting I** 4  
 Studies accounting principles pertaining to the income statement and balance sheet, cash receipts, disbursements, and reconciliations, accounts receivable, and bad debts.
- 0141 Individual Income Taxes** 4  
 Presents accounting procedures and problems associated with state and federal income tax laws pertaining to individuals, estates, and trusts.
- 0142 Job Order Cost Accounting** 4  
 Studies job order cost accounting procedures, manufacturing overhead control, departmentalization, material and labor control, and report forms.
- 0143 Business Law II** 3  
 Continues Business Law I (0122), with emphasis on bailments, secured transactions, partnerships and corporations, property, wills and trusts, insurance, surety ship, guaranty, and bankruptcy.
- 0150 Intermediate Accounting II** 4  
 Provides intermediate and advanced study of accounting principles pertaining to corporations, temporary investments, long-term investments, special bond transactions, amortization, revaluation of plant and equipment, retirement of plant and equipment, repairs and maintenance, depreciation, natural resources, intangible assets, and inventory valuation.

- 0151 Process Cost Accounting** **4**  
 Studies process cost accounting, standard cost procedures, and estimation and control of costs through budget use and profit analysis.
- 0152 Business Income Tax** **4**  
 Studies accounting procedures and problems pertaining to federal income tax law, state laws for corporations, and partnerships.
- 0153 Microeconomics** **3**  
 Examines the economics of supply and demand with regard to the individual consumer and producer. Studies factors determining price, output, allocation of scarce resources, distribution, and income.
- 0154 Macroeconomics** **3**  
 Provides analysis of national income accounting through study of GNP and components. Attention given also to the operation of the monetary and banking system and international economic problems.
- 0155 Managerial Accounting** **3**  
 Studies the relationship of accounting records to management decision-making. Covers internal accounting records, the role of data processing, and quantitative business analysis.
- 0156 Accounting Laboratory** **1-6**  
 Offers exercises in solving accounting problems, using concepts and theories learned in previous accounting technology courses.
- 0157 Payroll Accounting** **4**  
 Studies the payroll accounting practices associated with small and medium-sized firms and larger corporations.
- 0160 Intermediate Accounting III** **4**  
 Covers accounting practices pertaining to stockholder's equity, corporate earnings, corporate dividends, statement of change in financial position, and financial statement analysis.
- 0162 Auditing** **3**  
 Studies public accounting organization and operation, including internal control, internal auditing, verification of the balance sheet and operating accounts, and the auditor's report of opinion.
- 0164 Money and Banking** **3**  
 Studies monetary and banking theories as they relate to present-day domestic and international problems, with topics including banking operations, price changes, international monetary relationships, and application of monetary and fiscal policy.

- 0165 Budgeting** **3**  
Presents procedures for the preparation and use of business budgets. Emphasis placed on budgeting as an important aid in coordinating and directing business operations.
- 0166 Introduction to Management** **3**  
Studies the vital role of management in organizations of various sizes. Examines the interrelationships of various departmental functions and establishes the lines of authority and responsibility. Also studies the manager's duties with regard to communications, motivation, and delegation of authority.
- 0167 Seminar in Accounting** **1**  
Provides an opportunity to pursue areas of special interest in accounting at a more advanced level.
- 0169 Personal Finance** **3**  
Emphasizes management of individual financial resources for growth and maintenance of personal wealth. Covers home buying and mortgage financing, installment financing, life insurance, securities, commodities, and other investment opportunities.
- 0171 Principles of Finance I** **3**  
Studies business finance as influenced by capital structure and types of ownership. Attention given also to sources and methods of financing.
- 0172 Principles of Finance II** **3**  
A continuation of Principles of Finance I (0171). Covers tools of financial analysis and financial management, problems relating to sources of financing, and economic theory as applied to business finance.
- 0173 Consumer Credit** **3**  
Studies the economic and social aspects of credit and the institutions supplying consumer credit. Organizes the consumer credit cycle into basic areas of acquisition, control, and collection and examines it in relation to the various consumer credit grantors.
- 0174 Credit Procedures** **3**  
Examines principles and methods of credit administration in the mercantile and retail fields. Covers sources of information, credit policy, credit control, legal remedies, and collection techniques.
- 0175 Credit Management I** **3**  
Studies the functions of management in acquiring and controlling a cycle of credit and explores the occupational opportunities in the credit field. Includes lectures, discussions, and individual research and projects with written and oral presentations of findings.

- 0176 Credit Management II** 3
- Studies management of credit operations, management functions pertaining to collection cycle, and credit law. Includes lectures, discussions, and individual research and projects with written and oral presentation of findings.
- 0177 Commercial Credit** 3
- Presents theory, principles and practices of credit and collection management as they pertain to the needs of businesses. Deals with all phases of commercial, consumer, and mortgage credit, with emphasis on commercial and on short and intermediate term credit. Attention given to managerial functions with regard to credit acquisition and control and collection policies, procedures, and methods.
- 0178 Credit and Collections** 3
- Approaches the study of retail credit organizations, operations, and investigations, including retail terms and policies and the opening of credit accounts, from both retail and mercantile standpoints. Includes study of mercantile credit operations, credit information, and methods of collection of past due accounts, and analysis of financial statements.
- 0179 Review course: Accounting Practitioner's Exam - Theory** 4
- Prepares candidates for the Indiana State Board of Accountancy Accounting Practitioners' Examination. The examination is based upon the theory and practice sections of the *Uniform Certified Public Accountants Examination*.
- 0180 Review Course: Accounting Practitioner's Exam - Practice** 4
- Prepares advanced students for the Indiana State Board of Accountancy Accounting Practitioners' Examination.
- 0320 Management Principles** 3-4
- Describes the functions of managers, including management of activities and personnel. Focus placed on application of guidance principles in management work.
- 0322 Personnel Administration** 4
- Focuses on the activities of the personnel administrator, with emphasis on employer-employee relations, job analysis, job evaluation, salary administration, work measurement and standards, and performance appraisal.
- 0323 Business Principles and Organization** 3
- Examines our business system in relation to our economic society. Studies business ownership, organization principles and problems, management, control facilities, administration, and development practices of American business enterprises.
- 0328 Laws Applied to Business** 3-4
- Examines laws pertaining to business, with focus on contracts, the Uniform Commercial Code, and forms of business organization.

- 0329 Principles of Investing** **3**  
Presents the basics of investing, with attention to how various investment vehicles operate.
- 0330 Transportation Law I** **3**  
Prepares students for the A.S.T. & T. certification program. Covers judicial systems and regulatory agencies, regulatory acts, Motor Carrier Act-1980, Staggers Rail Act-1980, obligations, rights and liabilities, regulation of rates, and rate-making agreements.
- 0331 Transportation Law II** **3**  
Prepares students for the A.S.T. & T. certification program. Covers carrier finance, mergers and acquisitions, discrimination and rebates, practices and procedures, I.C.C. general rules of practice, canon of ethics, and appeal and judicial review.
- 0412 Vocabulary Building** **3**  
Provides intensive study of spelling and vocabulary. Includes rules of spelling, effective use of the dictionary, and techniques for building the vocabulary.
- 0432 Speed Building I** **1**  
Develops speed and accuracy in straight copy typing, with minimum exit speed at 45 net words per minute.
- 0441 Speed Building II** **1**  
Develops speed and accuracy from straight copy typing, with minimum exit speed for course set at 50 net words per minute.
- 0452 Speed Building III** **1**  
Develops speed and accuracy in straight copy typing, with minimum exit speed at 55 words per minute net.
- 0453 Medical Terminology** **4**  
Studies terminology pertaining to medical ethics and professional conduct, including use, spelling, meanings of Greek and Latin prefixes, suffixes, roots and combining forms, and use of a medical dictionary.
- 0510 Fundamentals of Data Processing** **5**  
Introduces electronic data processing and programming, with emphasis on processing. Includes the development of data processing from manual methods through electromechanical to electronic, the role of data processing in business organizations, data processing applications, computer hardware, internal data representation, stored program concepts, programming systems, elementary programming, operations research, and data processing as a profession.
- 0511 Fundamentals of Programming** **5**  
Introduces computer programming, including basic concepts, procedures and language.

- 0512 BASIC Programming** **5**  
 Introduces BASIC, a computational, problem-oriented language. Covers use of arithmetical expressions, conditional control, iteration techniques, input-output specifications, tables, and sub-programs for solving problems involving computation.
- 0513 Fundamentals of Data Processing - Practicum** **1**  
 Supplements Fundamentals of Data Processing (0510) with practical experience.
- 0514 PASCAL Programming Language** **5**  
 Presents the PASCAL programming language, emphasizing PASCAL features that make modular programming easy. Attention given to the terminology used in writing programs that can be string-tested.
- 0520 COBOL Programming Fundamentals** **5**  
 Provides a working knowledge of the COBOL programming language and its applications to business data processing. Develops proficiency in solving basic business problems with COBOL language.
- 0521 Practical Computer Operations** **5**  
 Demonstrates computer operations, emphasizing proficiency in handling and setting up complex disc and tape file runs. Includes running book and message control functions and reading job descriptions and flow charts.
- 0522 Problem-Solving Fundamentals** **3**  
 Demonstrates efficient problem-solving techniques for computer programming logic problems. Develops ability and confidence through examples and exercises.
- 0530 Advanced COBOL Programming** **5**  
 A continuation of COBOL Programming (0520), with emphasis on complex file-handling techniques and use of advanced COBOL extensions. Develops a higher level of COBOL proficiency and a working knowledge of advanced features and techniques through laboratory experience.
- 0531 Operating Systems** **5**  
 Studies computer operating systems, purposes, structure, and functions. Studies how comprehensive sets of language translators and service programs, operating under supervisory coordination of an integrated control program, form the total operating system of a computer.
- 0532 Job Control Language** **4**  
 Studies in depth the basic and intermediate level control language oriented toward the multi-programming versions of OS, MFT and MVT. Focus placed on positional parameters, keyword parameters, operands, general formats, coding rules, and practical applications of the Job Control Language used in OS installations.
- 0533 Introduction of Microcomputers** **2**  
 Introduces the BASIC programming language for members of the small business

community. Covers BASIC programming concepts for micro- and mini-computers, the components of a computer system, common input/output devices, and software for business systems.

#### **0534 Introduction to Electronic Data Processing 7**

Introduces mathematics useful in solving or simplifying computer programs, including numbering system, logic, and algorithms. Includes the role of data processing in an organization, computer applications, computer hardware, internal data representation, stored program concepts, and programming as a profession.

#### **0540 Systems Analysis and Design 4**

Studies functions and techniques of systems analysis, design, and development. Includes scientific analysis, systems flow charting, data collection techniques, file design and management, and processing and equipment requirements. Stresses reporting methods and communications between the user and the data processing department. Includes analysis of case studies for problems and solutions.

#### **0541 COBOL Programming III 5**

Offers advanced study in COBOL programming, including programming with direct access devices and using the COBOL SORT feature. Covers structured programming and documentation and continues study of job control language.

#### **0551 Business Programming Applications 5**

Offers advanced study in business programming as applied to distribution, manufacturing, banking, and insurance corporations. Covers billing, accounts receivable, sales analysis, payroll, inventory, and costs computed both by manual and computer methods. Includes exercises in programming.

#### **0560 Data Communications 4**

Demonstrates data communications techniques as applied to data processing. Includes vocabulary and techniques common to remote processing, time sharing, and data transmission.

#### **0568 BASIC Language Programming 4**

Course designed for those with no previous background in computers or programming. Includes terminology, common input/output devices, computer software, flowcharting, rules of the BASIC language, arithmetic and string operations, input and output operations, program control statements, and programming debugging and testing techniques.

#### **0569 BASIC Assembly for Microprocessors 4**

Introduces BASIC language microcomputers. Includes reading and writing programs.

#### **0570 Assembler Language Fundamentals 5**

Introduces machine-oriented, low-level programming language (the language taught depends on the type of machine access) and its commercial applications. Labo-



ratory exercises include coding, debugging, and testing of assembler language programs.

### **0571 Survey of Business Data Processing 3**

Surveys the scope and significance of data processing for businesses. Familiarizes the student with basic computer concepts, punched card unit record equipment, and electronic data processing equipment.

### **0572 FORTRAN IV Programming Fundamentals 5**

Introduces FORTRAN, a computational, problem-oriented language. Includes arithmetical expressions, conditional control, iteration techniques, input-output specifications, tables, and subprograms to solve problems involving computation.

### **0573 RPG II Programming Fundamentals 5**

Demonstrates the use of compiler language RPG in solving business problems. Attention given to multiple input and/or output and the use of business mathematics.

### **0574 PL/I Programming I 5**

Introduces the PL/I programming language, its capabilities, limitations, and uses in solving programming problems. Laboratory exercises include coding, debugging, and testing of PL/I programs.

### **0575 Topics in Data Processing I 5**

Discusses topics of current interest in data processing. Attention given to special interest projects for advanced students in data processing.

### **0576 Advanced Assembler Language 5**

A continuation of Assembler Language Fundamentals (0570), with emphasis on disk and tape programming techniques.

### **0577 Topics in Data Processing II 5**

A continuation of Topics in Data Processing I (0575)

### **0579 Advanced RPG/II Programming 5**

A continuation of RPG II Programming Fundamentals (0573).

### **0582 Advanced BASIC Language Programming 4**

A continuation of BASIC Programming (0512), with emphasis on complex file-handling techniques and use of advanced extensions. Laboratory exercises aid in gaining proficiency and a working knowledge of advanced features and techniques in BASIC programming.

### **0583 Database Design 4**

Introduces program applications in a database environment, with emphasis on loading, modifying, and querying the database by means of a host language (COBOL). Discusses data structures; indexed and direct file organizations; models of data,

including hierarchical, network, and relational; storage devices; data administration and analysis; design; and implementation.

#### **0585 Distributed Data Processing**

4

Examines centralized, decentralized, and distributed systems and the impact of distributed systems on business enterprise. Discusses the technological developments in computer hardware, software, and communications as they relate to the design, development and implementation of distributed data processing systems.

#### **0590 C.I.C.S. Command Level Programming**

4

Studies the organization, operation, and use of C.I.C.S., the principles of data communication, and the incorporation of those principles in C.I.C.S. Students will write pseudo-conversational C.I.C.S programs to illustrate such features as terminal control, file control, reentry, task mapping, temporary storage and program control.

#### **0711 Introduction to Hospitality Management**

4

Traces the growth and development of the lodging industry from early practices to modern high-rise commercial hotels and highway motels, with special attention given to future trends and opportunities. Studies the nature and organization of the business, including sales promotion, guest relations, guest room facilities, space utilization, food and beverage facilities, accounting records, financial management, and administrative control.

#### **0712 Front Office Procedures**

4

Introduces front office principles, problems, and procedures related to modern lodging operations. Covers public relations, front office responsibilities, salesmanship, cashier's charges, and posting machines.

#### **0723 Convention Management**

3

Examines cooperative relationships between successful hotel and motel properties and emphasizes methods of convention sales.

#### **0728 Hotel-Motel Seminar**

3

Offers opportunity to explore particular problems or topics of current interest through guest lectures and group discussion.

#### **0729 Restaurant Operations**

4

Provides an overview of restaurant operations, with hands-on experience in a specialty restaurant setting.

#### **0731 Basic Cooking Methods**

4

Explains and demonstrates the 14 basic forms of food preparation.

#### **0732 Fish and Seafood Preparation**

4

Explains and demonstrates methods of preparation for hot and cold fish, crustaceans, shellfish, and mollusks. Uses baking, poaching, braising, sauteing, deep fat frying, broiling, grilling, and gratinating methods.

- 0733 Food and Beverage Management & Service** **4**  
 Presents principles and practices of food production and service management, sanitation, menu planning, cost and labor control, and the purchasing, storage, and merchandising of food and beverages. Discusses problems pertaining to labor shortages, convenience foods, and changes in consumer tastes.
- 0737 Meat Preparation** **4**  
 Explains and demonstrates the basic methods of preparation for beef, veal, pork, lamb, poultry and game. Includes sauteing, broiling, grilling, stewing, simmering, poaching, boiling, and braising methods.
- 0742 Food & Beverage Purchasing & Control** **4**  
 Studies major food groups (fresh and processed fruits and vegetables, dairy products, cereals and cereal products, beverages, poultry and eggs, fish and shellfish, meats, and alcoholic beverages) purchased by quantity buyers. Outlines the essentials of effective food and beverage control and establishes systems for determining sale values.
- 0743 Basic Cooking Methods II** **4**  
 Demonstrates the preparation of bases, stocks, sauces, and soups.
- 0744 Sanitation** **4**  
 Studies in detail the principles and practices of sanitation for food service operations. Includes general cleaning practices, environmental sanitation, and the scientific principles underlying good sanitation practices. Attention given also to personal hygiene and the importance of sanitation from economic and legal points of view.
- 0749 Advanced Baking: Blown and Pulled Sugar** **4**  
 Presents fundamental techniques of sugar work used in the creation of decorative and unique table settings.
- 0751 Food & Beverage Cost Control, Planning, & Procedures** **4**  
 Studies the various areas of control in a food and beverage operation. Covers the points of control, people planning, and procedures for stabilizing and monitoring controls.  
 \*(See also Culinary Arts courses page 161)
- 0752 Sales Promotion** **4**  
 Demonstrates the development of a marketing plan for any size operation. Shows how to unite all departments of a hotel operation into a coordinated team. Emphasizes the organization and functioning of the sales department, with attention to sales tools and techniques, advertising, and types of markets.
- 0760 Hotel-Motel Maintenance I** **3**  
 Examines the organization of a maintenance and engineering department. Discusses plumbing, heating, ventilation, refrigeration, air conditioning, and electrical sys-

tems, vertical transportation, structural maintenance, painting, landscaping, contracts, communication, acoustics, fire protection, and maintenance of kitchen equipment.

#### **0762 Hotel-Motel Supervisory Housekeeping 4**

Introduces the fundamentals of housekeeping management. Emphasis placed on employee training, record-keeping, health and safety, cost control, and executive housekeeper responsibilities.

#### **0763 Hotel-Motel Maintenance II 3**

Offers advanced study in hotel-motel maintenance and engineering. Emphasis placed on maintenance procedures and the establishment of preventive maintenance programs.

#### **0901 Quality Control Concepts and Techniques I 4**

Studies the latest quality control concepts and techniques in industry, with emphasis on modern manufacturing requirements.

#### **0902 Quality Control Concepts and Techniques II 4**

A continuation of Quality Control Concepts and Techniques I (0901), emphasizing the latest technological developments.

#### **0903 Quality Control Engineering Principles and Techniques 4**

Presents principles and techniques of modern quality control engineering, with attention to management, engineering, economic, and production factors. Emphasis placed on the assurance of quality at the hardware, processing, and systems levels.

#### **0904 Statistical Concepts and Techniques—Prerequisite: 0901 4**

Presents a variety of topics involving Q.C. statistical applications, including frequency distribution, probability theory and applications, and sampling techniques.

#### **0905 Quality Control Engineering Theory and Application—Prerequisites: 0901, 0902, 0903, and 0904 4**

Presents the latest theory and applications of quality engineering for assurance and verification of product quality at the hardware, processing, and systems levels. Emphasis placed on statistical analysis, laboratory experiments, and test and case problem-solving applications.

#### **0907 Reliability Objectives—Prerequisites: 0901, 0902, and 0904 4**

Introduces the development and principles of reliability engineering; establishes the mathematical and physical bases of reliability; and applies the basic elements of reliability data analysis. The course surveys concepts basic to modern reliability requirements, placing emphasis on practical applications in manufacturing process and production operations.

#### **0908 Introduction to Nondestructive Tests—Prerequisite: 0908 4**

Presents an overview of the relationship of nondestructive testing to the total quality function. Attention given to the advantages and limitations of various test methods.

- 0909 Mechanical Metrology** 4  
Provides instruction and laboratory experiments in the use of mechanical testing and measurement equipment for quality control.
- 0912 Manufacturing Organization I** 3  
Studies the organization of a typical manufacturing operation with attention to the functional components of the organization and their interrelationships. Reviews organizational principles as they apply to the operation and examines the duties and responsibilities of the first-line supervisor. Develops the basic tools of managerial decision-making and applies them to typical case problems.
- 0913 Techniques of Supervision I** 3  
Studies employee development, with emphasis upon the responsibilities of the beginning or newly appointed supervisor. Includes functioning within an organizational structure; communications, motivation, delegation of authority, interviews, orientation and induction of new employees, and evaluation of employee performance.
- 0915 Electrical Metrology** 4  
Provides instruction and laboratory experiments in the use of electrical testing and measurement equipment for quality control.
- 0916 Procurement Quality Control** 4  
Studies principles and functions of procurement quality control. Covers inspection techniques, tools, and records.
- 0917 Reliability Techniques** 4  
Studies reliability techniques and applications to obtain or improve reliability analysis.
- 0921 Principles of Industrial Safety** 3  
Provides training in accident prevention, with emphasis on safety practices, fire prevention, first aid, accident investigation, and rules of plant protection.
- 0923 Techniques of Supervision II** 3  
A continuation of Techniques of Supervision (0913). Studies skills needed for effective supervision of personnel. Includes group discussion of selected topics, case studies, and in-basket situations.
- 0925 Manufacturing Organization II** 3  
A continuation of Manufacturing Organization I (0912). Studies quality control, research and development, marketing, production, inventory control, personnel, and maintenance functions. Attention given also to forms of ownership, analysis of financial data, capital investment considerations, and budgeting.
- 0926 Floor Care** 3  
Provides instruction in the various types of flooring and the procedures for floor care. Course designed for students in custodial maintenance.

- 0928 Restroom Care** **3**  
Covers cleaning service procedures for restrooms as part of janitorial service work.
- 0930 General Industry OSHA and First Aid** **3**  
Studies the Occupational Health and Safety Act (OSHA) and standards. Alerts the student to industrial hazards and demonstrates first aid techniques as outlined in the American Red Cross multimedia course.
- 0931 Time and Motion Study** **3**  
Demonstrates industrial applications of time and motion studies in establishing rates.
- 0932 Safety Regulations** **3**  
Studies the preparation and maintenance of accident records, severity rates, and workmen's compensation and insurance claims, and the management of safety programs to comply with laws or contractual agreements.
- 0933 Fundamentals of Quality Circles** **4**  
Discusses the history, theory, and fundamentals of quality circles. Includes case studies and techniques for problem prevention.
- 0940 Quality Control** **3**  
Studies the function of quality control in fulfilling organizational objectives. Includes principles and techniques of quality control, vendor-customer relationships, sampling inspections, process control, and tests for significance. Attention given to the type of quality control best suited to the needs of particular industries.
- 0941 Labor Relations** **3**  
Studies labor laws and practices pertaining to industrial relations. Covers development and application of laws, mediation, conciliation, collective bargaining, arbitration, and handling of grievances.
- 0942 Purchasing and Inventory Control** **4**  
Studies purchasing procedures and inventory management.
- 0950 Manufacturing Costs and Value Analysis** **3**  
Studies testing procedures used to measure value and reduce costs in design, development, and manufacturing without loss of quality. Differs from cost control in that the focus is on value rather than cost.
- 0951 Production Planning and Control** **3**  
Studies production planning concepts and inventory control techniques and their applications.
- 0952 Work Analysis and Improvement** **3**  
Demonstrates the value of work analysis and methods for work improvement, with

emphasis on the responsibilities of managers and supervisors. Introduces the tools of scientific analysis, methods of work simplification, and techniques of implementing improvements. Aids in the development of an effective work philosophy and the ability to effect positive change on the job.

### **0953 Introduction to Industrial Engineering 3**

Studies methods analyses in industrial engineering, approach to methods engineering, principles of motion economy, process charts, precedence charting, and line balancing.

### **0954 Materials Handling 3**

Studies applied stresses and quality controls pertaining to the handling and storing of industrial materials. Attention given to shelf life of materials, weight and mass configuration, and specifications of vendors' materials.

### **0956 Managerial Cost Accounting 3**

Studies standard cost systems, budgets, and use of budgets as control devices. Emphasis on methods of presenting and interpreting cost data for use in managerial decision-making.

### **0960 Economics of Industry 3**

Discusses the fundamentals of economics and the basic principles of business systems, using everyday language, with emphasis on the practical rather than the theoretical. Covers types of business organizations, costs and pricing, competition, money system, taxes, productivity, and automation.

### **0961 Plant Layout and Process Planning 3**

Studies principles and practices of factory planning, including layout fundamentals, layouts for small and medium-sized plants, and the selection of equipment for production and handling of materials. Attention given to tooling determination and operational time, setup, and sequence. Emphasizes efficient arrangement of work areas to reduce costs.

### **0962 Traffic and Transportation Management I 3**

Studies transportation systems, federal regulations, freight classification, rates, tariffs, and claims.

### **0963 Manufacturing Processes I 3**

Offers study for technicians in the technical aspects of manufacturing processes, with attention to industrial materials and machine tools used in modern processing.

### **0964 Industrial Assembly Techniques 3**

Studies methods of assembly, fasteners, assembly materials, metallurgy, plastics, and modern composition.

### **0967 Drafting & Manufacturing Standards 3**

Offers drafting theory and practice, with special attention to standard practices of

dimensioning, tolerancing, and notations of tooling components. Covers revolving out of position, line elimination, and sectioning.

#### **0968 Case Problems in Management**

4

Requires the student to apply both quantitative and qualitative skills to case study problems in management. Solutions demand planning, leadership, and financial analysis.

#### **0970 Personnel Management**

3

Studies manpower planning, employee recruitment, selection and placement, promotions, transfers, separations, and wage and salary administration.

#### **0971 Manufacturing Processes II**

3

Studies design, specifications, facilities, and economics of manufacturing processes and materials. Includes visits to several manufacturing concerns.

#### **0972 Traffic and Transportation II**

3

A continuation of Traffic and Transportation Management I (0962).

#### **0973 Training for Results**

3

Studies employee training as an organizational resource. Demonstrates how to develop and implement effective training programs. Covers the nature of learning, concept teaching, the creation of a motivating learning atmosphere, use of audiovisual aids, planned versus spontaneous learning, rote teaching, mnemonic devices, learning curves, and learning as problem solving.

#### **0974 Conference Leadership**

3

Outlines the personal qualities and skills needed in conference leadership. Assists participants in developing their roles as organizers, facilitators, controllers, summarizers, speakers, and problem-definers and solvers. Demonstrates effective means of utilizing and developing the resources of others.

#### **0975 Management Information Systems**

3

Presents concepts and applications of business management information systems, with emphasis on the role of information systems persons and equipment. Attention given to the systems approach to problem identification and solution, information and the management process, system analysis and design, and other management systems. Includes class discussion of organizational examples.

#### **0977 Industrial Supervision Seminar**

3

Provides opportunities to explore various leadership styles and their effects on others in a low-risk atmosphere. Aids the student in developing alternative patterns of leadership.

#### **0980 Case Problems in Labor Relations**

3

Studies labor relations problems and methods of arbitration. Students will study briefs from both sides of actual arbitration cases and render decisions, which will be discussed in class and compared with those made by the actual arbitrators.



## **0982 Management by Objectives** **3**

Investigates practical uses, values, and problems of an MBO system. Participants will develop company, departmental, and individual objectives and determine how to implement them effectively.

## **0983 Time Management** **2-3**

Trains supervisors and other personnel in effective management of the business day. Attention given to time management strategies and behavior patterns. Provides exercises in scheduling and allocating time, identifying and handling time wasters, dealing with interruptions, and planning for better use of the working day.

## **1112 Introduction to Business** **4**

Provides a broad overview of business operations, including management, marketing, production, finance, accounting, data processing, legal structures, economics, and the role of government in business.

## **1114 Marketing I** **4**

Introduces the field of marketing and the basic concepts of marketing goods and services, with attention to marketing mix.

## **1115 Sales Techniques** **4**

Provides an overview of selling and selling skills, including the work of the sales-salesman. Studies the psychology of selling and develops selling skills through a programmed series of selling situations.

## **1116 Marketing II** **4**

A continuation of Marketing I (1114), with application of business and marketing concepts and principles to case studies.

## **1126 Principles of Wholesaling** **4**

Studies wholesaling within the marketing distribution structure, including the design and management of channels of distribution. Attention given to the wholesale market and wholesaling middleman, relationships with manufacturers and retailers, and activities incident to the sale of products for resale or business use.

## **1130 Bank Teller Procedure** **6**

Prepares students for bank teller positions. Course includes business math, personal development, banking transactions, bank security, customer relations, and role-playing activities. Offers hands-on experience in simulated situations in a bank tellers' training facility.

## **1134 Sales Management** **4**

Focuses on the role of the sales manager, with emphasis on the leadership function. Demonstrates personal selling as the major promotional method used in the American economic system. Covers building a sales team, judging sales performance, territorial management, techniques of sales recruiting and interviewing, training and development, and managing the field sales office, including sales support and liaison, property, liability, and operations.

**1135 Principles of Retailing 4**

Studies retailing concepts and practices, including retail merchandise planning, buying, pricing, promotion, and control in established retail operations. Attention given to managerial and operational skills.

**1136 Physical Distribution 4**

Studies the physical flow of products and the operation of efficient flow systems, with emphasis on the economics of transportation. Examines rates, traffic service, and coordination problems of transportation systems.

**1137 Buying and Inventory Control 4**

Focuses on decision-making and skills required in the purchasing of products and services for business. Attention given to procurement, negotiation, transportation, and inventory management.

**1140 Real Estate Sales 4**

An introductory course taught in accordance with the guidelines established by the Indiana Real Estate Commission. Topics include property description, marketing, real estate, licensing, financing, contracts, zoning, closing procedures, and property management.

**1147 Principles of Advertising 4**

Focuses on advertising as the key element in the promotion of goods and services in the marketplace. Attention given to advertising media and media selection, advertising copy strategy, advertising regulations, and organization of advertising functions.

**1148 Principles of Insurance 4**

Examines risks faced by business firms and considers ways of handling them. Covers property, liability, and personal losses, with attention to insurance contracts and their uses. Includes individual life, health and pension insurance, public policy, government regulations, and social insurance programs.

**1151 Introduction to Public Relations 4**

Introduces the public relations field, including the role of public relations in business and industry, nonprofit organizations, the benefits of public relations, the tools of the public relations practitioner, and principles and trends of the field.

**1152 Real Estate Brokerage Procedures 3**

Studies brokerage procedures, including real estate instruments, values, deeds and contracts, leases, property management, real estate financing, legal and governmental aspects of real estate, and arithmetical functions.

**1156 Advanced Sales Techniques 3**

Demonstrates successful application of selling techniques, including probing, supporting, overcoming objections, and closing. Attention given to techniques for counseling and training others to improve their selling skills.

- 1157 Entrepreneurship** **4**  
 Explores small business operations for the self-employed or for the generalist administrator employed in a small business enterprise. Includes entry into small business, form and structure of the business, financing and tax considerations, business hazards, government regulations, and doing business with the government.
- 1208 Refresher Shorthand** **2**  
 Brings unused shorthand skills to an employable level, with emphasis on theory, transcription, and speed.
- 1209 Refresher Typewriting** **2**  
 Brings unused typing skills to an employable level, with emphasis on business letters, tabulation, speed, and accuracy.
- 1210 Shorthand I** **4**  
 Introduces symbol shorthand, including theory, brief form, and speed in reading from plate notes or machine notes. Introduces dictation, with emphasis on writing shorthand outlines or mastering the machine keyboard.
- 1211 ABC Shorthand** **4**  
 Offers an alternative shorthand, using letters of the alphabet rather than shorthand symbols.
- 1212 Typewriting I** **4**  
 Studies touch typewriting techniques and their applications. Includes typing of business letters and manuscripts, centering, tabulation, machine parts and care, and speed development.
- 1213 Switchboard Operation** **1**  
 Introduces use of the telephone switchboard and operation of the PBX800. Covers message systems, visitor hospitality, and role of the receptionist.
- 1214 Personal Development** **3**  
 Analyzes and improves posture and develops weight control. Attention given to personal hygiene, grooming, wardrobe, personality, and communication skills, resume-writing, and interviewing skills.
- 1215 Filing** **3**  
 Demonstrates procedures for maintaining and retrieving business records of various types. Includes indexing, coding, sorting, cross-referencing, filing techniques, and follow-up procedures.
- 1217 Machine Speed & Accuracy Drill** **1**  
 Improves speed and accuracy through drills on the typewriter and other office machines.

- 1218 Speedwriting** 4  
Covers speedwriting theory and transcription, with skill development to 80 wpm. Letters are 1 1/2 minutes long, tests three minutes long.
- 1220 Shorthand II—Prerequisite: 1210** 4  
Develops dictation, note-reading, and transcription skills through drills and tests. Emphasizes speed and accuracy and correct use of English.
- 1222 Typewriting II** 4  
A continuation of Typewriting I (1212). Includes business letters, forms, manuscripts, and tabulations. Builds speed and accuracy with emphasis on production typing.
- 1224 Records Management** 3  
Introduces methods and procedures of maintaining business records of various types, with attention to filing systems and file maintenance. Develops skills through practice situations.
- 1226 Data Entry** 4  
Develops a high level of skill in the keyboarding operation of modern data-entry equipment. Emphasis on speed and accuracy.
- 1230 Shorthand III** 4  
Reviews fundamental skills, emphasizing new matter dictation and mailable transcription. Emphasizes correct use of English.
- 1231 Transcription I - Practicum** 1  
Offers practice in editorial skills, emphasizing grammar, spelling, and punctuation. Attention given also to shorthand theory and typing production factors.
- 1232 Typewriting III** 4  
Improves production typewriting skills, including complex tabulation, statistical reports, rough drafts, manuscripts, and forms.
- 1234 Typewriting III - Practicum** 1  
Supplements Typewriting III (1232).
- 1236 Office Calculating Machines** 3  
Develops competency in the operation of adding and calculating machines used in business offices.
- 1237 Office Calculating Machines II** 4  
A continuation of Office Calculating Machines I (1236), emphasizing newly developed machines and case studies.

- 1240 Shorthand IV** 4  
A continuation of Shorthand III (1230).
- 1241 Clerical Office Procedures** 3  
Explores the range of opportunities available in the clerical field. Includes filing, machine transcription, duplicating machine techniques, and receptionist training. Also introduces duties of the legal, medical, and administrative secretary.
- 1242 Typewriting IV** 4  
A continuation of Typewriting III (1232).
- 1243 Office Management and Procedures** 3  
Studies human relations, personnel department functions, and employment procedures, with emphasis on management skills and business office techniques. Offers opportunities to apply knowledge and skills in office management situations.
- 1244 Transcription II - Practicum** 1  
A continuation of Transcription I - Practicum (1231).
- 1245 Business English for Word Processing** 4  
Studies basic grammar, punctuation, spelling, proofreading, and other language skills needed in word processing.
- 1246 English Grammar I** 4  
Designed especially to help secretarial students gain mastery of the English language through analysis of sentence structure.
- 1247 English Grammar II** 4  
Helps students master English language skills through study of agreement, case, punctuation, usage, and modifiers.
- 1250 Shorthand V** 4  
A continuation of Shorthand III and IV (1230, 1240), with emphasis on technically specialized materials.
- 1253 Word Processing—Principles and Basic Systems** 3  
Introduces history and concepts of word processing systems. Offers practical experience in the operation of complete word processing systems, including use of various types of hardware and soft-ware.
- 1254 Word Processing Seminar** 1  
Introduces word processing, including theory, concepts, terminology, and procedures. Demonstrates developments in word processing equipment.
- 1255 Introduction to Word Processing** 4  
Introduces word processing, including theory, terminology, procedures, and

career possibilities. Examines input, output, processing, control, and feedback from the status of equipment, personnel, and procedures. Also presents methods of determining the feasibility of implementing new equipment in the office.

#### **1256 Word Processing Operations 4**

Provides hands-on training on word processing equipment. Emphasis placed on English grammars principles and proofreading skills.

#### **1257 Word Processing Applications 4**

Offers experience in applying word processing operations toward solving problems and developing projects.

#### **1258 Magnetic Keyboard Typewriting 4**

Introduces recording procedures and revising and repetitive letter techniques on the IBM Memory Typewriter.

#### **1260 Shorthand VI 4**

Presents speed building, new matter dictation, and some transcription work on the production of mailable copy. Attention given to technical terminology, phrases, and abbreviations peculiar to certain organizations.

#### **1261 Administrative Office Practice 3**

Emphasizes skills, techniques, and attitudes necessary for successful office practice. Attention given to human relations, use of office machines, business correspondence, mailing, filing, telephoning, personal hygiene, dress, and interviewing for the job. Offers opportunities to apply business skills and knowledge in a laboratory situation.

#### **1262 Typewriting V 4**

Focuses on production techniques pertaining to correspondence, business forms, manuscripts, tabulation, secretarial projects, and transcription of machine-recorded dictation. Emphasis on grammar, spelling, and letter format.

#### **1264 Intensive Secretarial Laboratory I 6**

Offers opportunity to gain secretarial experience and skills in a simulated office environment.

#### **1265 Word Processing Typewriting 2**

Trains typists for entry level positions in word processing centers. Includes word processing concepts and machine operation. Attention given to application problems and new trends in equipment and procedures.

#### **1267 Machine Dictation and Transcription 2**

Develops transcription and communication skills and integrates those learned in other areas, such as typing and technical and business communications. Broadens marketable skills through use of machine transcription equipment.

- 1268 Machine Transcription for Word Processing** **4**  
 Teaches the use of transcription machines and the production of a mailable transcript. Emphasis on spelling and punctuation.
- 1270 Introductory Typewriting (Non-majors)** **3**  
 Introduces the fundamentals of touch typewriting to beginners.
- 1271 Introductory Clerical Office Procedures (Non-majors)** **5**  
 Explores the range of employment opportunities available in the clerical field. Studies the requirements and qualifications for specific positions.
- 1273 Typewriting VI** **4**  
 Provides instruction and production practice in medical, legal, and technical typewriting, emphasizing typing from rough draft and unarranged copy. Includes speed-building, photocopying, and decision-making.
- 1275 Word Processing Files Management** **4**  
 Demonstrates how to create, use, change, and update files on the IBM 5520 Administrative Word Processing system.
- 1310 Legal Terminology** **2**  
 Studies ethics of law, professional conduct, words using Latin prefixes and suffixes, word roots, combining forms, spellings, and use of the legal dictionary.
- 1313 Legal Office Bookkeeping** **4**  
 Introduces principles and practices of bookkeeping relevant to the legal office, including debit and credit, double entry, and use of journals. Analyzes transactions, posting procedures, and cash and accrual bases of accounting. Attention given also to handling petty cash, banking procedures, payroll, work sheets, balance sheets, and income statements.
- 1321 Legal Office Procedures** **4**  
 Studies the secretarial and bookkeeping duties and responsibilities associated with the legal profession. Covers legal correspondence and records, client files, filing, financial administration, contact procedures with clients, courts, and professional agencies. Attention given also to desirable personality traits, interpersonal relationships, and attitudes within the law office.
- 1331 Legal Office Communications** **3**  
 Develops communications skills required in the legal office, with emphasis on oral and written communications.
- 1341 Legal Office Practice** **4**  
 Emphasizes skills, techniques, and attitudes necessary for successful office practice. Attention given to human relations, use of office machines, business correspondence, mailing, filing, telephoning, personal hygiene, dress, and interviewing for the job. Offers opportunities to apply business skills to legal forms and procedures in a

laboratory situation. Includes research assignments and maintenance of legal calendars and files.

**1342 Typewriting IV Legal 4**

Improves production typewriting skills, with emphasis on the preparation of legal documents.

**1345 Shorthand IV Legal 4**

Develops competence in specialized legal dictation and transcription of legal correspondence, forms, and documents. Emphasis placed on constructing shorthand outlines of legal terms.

**1432 Medical Machine Transcription 2**

Reinforces the student's command of medical terminology, including names of medical science fields and specialties, common drugs, and diseases. Includes study of prefixes, suffixes, and abbreviations in medical transcription.

## **GRAPHICS & MEDIA**

**1610 Introduction to Photography I (Non-Majors) 2**

Introduces picture-taking and darkroom techniques to the student with little or no background in photography.

**1611 Introduction to Photography II (Non-Majors) 2**

A continuation of Introduction to Photography I (1610), with emphasis on equipment, materials, lighting, and visualizing with the camera.

**✓ 1614 Fundamentals of Photography I 2**

Presents the fundamentals of black and white photography, film developing, and printing

**1615 Photographic Science and Theory I 3**

Studies camera types, exposure meters, and darkroom chemistry, including films and photographic papers.

**✓ 1616 Studio Practice I 2**

Studies studio equipment and setup procedures, with emphasis on use of one light and reflectors.

**1624 Fundamentals of Photography II 2**

A continuation of Fundamentals of Photography I (1614), with emphasis on composition, camera techniques, and black and white darkroom processes.

**1625 Photographic Science and Theory II 3**

Studies light, lenses, and black and white developers.



- 1626 Studio Practice II** **2**  
 Demonstrates the use of multiple light setups to achieve proper ratios and exposures. Also covers diffusers, barndoors, scrims, and snoots.
- 1627 Darkroom Techniques I** **2**  
 Introduces black and white film and print processing.
- 1628 Darkroom Techniques II** **3**  
 Studies contrast control in film and print processing, techniques for consistency in black and white printing and processing, and darkroom troubleshooting. Also compares and tests developers.
- ✓ **1632 Architectural Photography I** **2**  
 Demonstrates photography of architectural structures; includes interiors and exteriors.
- 1633 Sensitometry I** **2**  
 Estimates the response of photographic materials to radiant energy. Attention given to methods of exposing, processing, measurement, and data evaluation.
- 1634 Sequential Photography** **3**  
 Studies photography as a storytelling medium.
- ✓ **1635 Product Photography** **3**  
 Introduces the photographing of table-top and larger products. Demonstrates setup and lighting techniques used in commercial photography.
- 1636 Studio Practice III** **2**  
 Provides practice in the use of view cameras and filters.
- 1638 Darkroom Techniques III** **2**  
 Studies the use of live film. Includes processing of color transparencies, color negatives, and color prints.
- 1640 Architectural Photography II** **3**  
 Studies the photographing of more complex architectural situations. Emphasis on small and large room interiors and artificial light.
- 1641 Sensitometry II** **3**  
 Deals with all aspects of color transmission and reflective sensitometry using color prints, color negatives, and color transparencies. Includes processing, analysis, and graphing of color test strips.
- 1642 Industrial and Commercial Techniques I** **2**  
 Studies use of view cameras in controlling perspective and distortion. Attention given to problems of lighting and shooting on location.

**1644 Studio Practice IV 2**

Studies the lighting of unusual objects and materials, including large objects and those made of glass, chrome, plastic, and wood.

**✓ 1645 Photographic Composition 3**

Studies the principles of photographic composition.

**1650 Advanced Photographic Composition 2**

A continuation of Photographic Composition (1645), with emphasis on individual style.

**1652 Industrial and Commercial Techniques II 3**

Deals with producing photographs for reproduction, with special emphasis on parts catalog shots and exploded views.

**1654 Product Illustration 2**

Studies illustrative aspects of photography as applied to commercial products.

**/ 1655 Basic Portrait Lighting 2**

Introduces studio portrait lighting techniques and equipment.

**1660 Black and White Portraiture 2**

Demonstrates specialized techniques used in the photographing and printing of black and white portraits.

**1661 Photographic Science and Theory III 3**

Studies color photography, including transparencies, negatives, prints, and processes.

**1662 Industrial and Commercial Techniques III 3**

Explores techniques of painted light, rear screen projection, and product illustration.

**✓ 1663 Color Portraiture 2**

Presents specialized techniques used in the photographing and printing of color portraits.

**1664 Negative Retouching 2**

Demonstrates retouching techniques for black and white portrait negatives.

**1665 Custom Color Printing 2**

Offers comprehensive study of theoretical and practical aspects of color photography.

**1667 Custom Color Printing 5**

Explores areas of color photographic printing, using analyzers and other color

printing aids. Includes color exposures and processing and techniques of color correction.

### **1668 Specialized Commercial Techniques 3**

Presents specialized techniques used in commercial photography, with attention to lighting, camera work, and processing.

### **1670 Fundamentals of Optics 2**

Studies the behavior and control of light in lenses.

### **1671 Advanced Portraiture 2**

Presents advanced study of portraiture, including groups and special effects.

### **1672 Industrial and Commercial Techniques IV 3**

Studies techniques of photographic situation illustrations, architectural structures, and night exposures.

### **1673 Advanced Product Photography 2**

Presents large format color product photography.

### **1674 Journalistic and Editorial Photography 2**

Studies the production of photographs with a story-telling approach. Includes the writing of captions.

### **1675 Specialized Industrial Techniques 2**

Presents specialized photographic techniques used in industry. Includes time-motion study photographs, stress studies, and infrared.

### **1676 Advanced Darkroom Techniques 2**

Presents rapid access processing, production of contrast masks and internegatives, and the use of color analyzers.

### **1677 Custom Quantity Printing 2**

Presents methods used to produce custom prints in large quantities.

### **1678 Color Negative Retouching and Print Finishing 2**

Demonstrates the retouching of color negatives and prints using modern materials and methods.

### **1679 Market Survey 2**

Students will conduct a survey and prepare a statistical report on the photographic industry in a given area.

### **1680 Natural Light Portraiture 2**

Studies techniques of photographing people by natural light. Attention given to posing, camera work, and use of special equipment.

**1801 Basic Color Mixing and Figure Organization 3**

Develops skills in color mixing and compositional organization through lectures, projects, and lab experiments.

**1802 Introduction to Aquamedia (Non-Majors) 3**

Consists of lectures, demonstrations, and projects in the use of gouache, polymer and watercolor as a visual medium.

**1803 Developmental Drawing Techniques I (Non-Majors) 3**

Presents experimental projects, lectures, and lab instruction in visualizing through the medium of the drawn image.

**1804 Introduction to Videotaping Processes 2**

Introduces the theory, use, and manipulation of video tape equipment.

**1805 Introduction to Audiotaping 2**

Introduces the theory and practice of audio taping

**1806 Audiovisual Slide Production 2**

Demonstrates the entire process of multimedia presentation, from the establishment of objectives to evaluation.

**✓ 1810 Composition and Design Fundamentals 2**

Studies fundamentals of composition and design, including tonal relationships, color complements, and contrasts. Explores the basic elements and applications of two-dimensional design.

**1811 Introduction to Illustration Media 2**

Introduces watercolor, gouache and acrylic.

**1812 Basic Drawing 2**

Studies basic concepts and techniques of drawing, with special attention to media use, perspective, and accuracy through use of line and mass of volume.

**1813 Visual Arts Careers Orientation 2**

Investigates opportunities in the visual arts. Includes job research, terminology, interviews, field observations, and collection of career information.

**1814 Basic Drawing Techniques I 2**

Develops drawing skills through use of basic media.

**1815 Composition and Design Techniques I 2**

Presents two-dimensional concepts and shapes, chroma, value, and applications.

**1816 Illustration Techniques I 2**

Develops dexterity in the application of transparent and opaque aquamedia.

- 1817 Fundamentals of Commercial Art Theory I** **2**  
 Surveys art concepts, media, techniques, and functions as they pertain to commercial art processes.
- 1820 Composition and Design Techniques II** **2**  
 Studies three-dimensional concepts of visual imagery and color optics and dynamics. Attention given to the illusion of 3D and the actuality of form, and the use, limitations, and physical manufacture of 3D materials for commercial use.
- 1821 Illustration Media II** **2**  
 Concentrates on aqua-media, with attention to various media applications
- 1822 Basic Drawing Techniques II** **2**  
 Provides further training in pencil and ink and introduces felt pen techniques. Emphasis on accuracy and quality of work.
- 1823 Illustration Techniques II** **2**  
 Consists of projects involving the application of aquamedia techniques, such as background and spot and product illustration.
- 1824 Typography Techniques** **2**  
 Presents methods of spacing, line count, comping, and letter forms for layout and finished art applications.
- 1825 Creative Typography** **3**  
 Studies the use of type as a design element in visual art. Includes lectures, demonstrations, and projects.
- 1826 Air Brush Rendering** **2**  
 Presents concepts and practices concerning the use of the air brush to render visuals in black and white and in color.
- 1827 Mixed Media Figure Drawing** **2**  
 Presents concepts and practices concerning the use of two or more media in combination for visual effect and impact.
- 1828 Multimedia Figure Drawing** **2**  
 Discusses concepts and problems pertaining to various media used in figure illustration. Examines the advantages and disadvantages of each medium.
- 1830 Typographic Theory** **3**  
 Introduces typography and its many uses.
- 1831 Black and White Illustration** **2**  
 Offers concentrated study in black and white illustration for reproduction

**✓ 1832 Introduction to Photography****3**

Presents theories and applications of basic camera types. Emphasis placed on the relationships of photography to commercial art and illustration.

**1834 Black and White Media Techniques****2**

Emphasizes techniques used in pen and ink, dry brush, gouache, and other black and white media. Also demonstrates the use of mechanical instruments for work in black and white.

**1835 Sketch Book Drawing****2**

Introduces anatomy through spontaneous drawing and visual perception.

**1836 Visual Arts Processes****2**

Explores problems of visual communication and ways in which the artist shapes man's environment.

**1840 Layout Design Fundamentals I****2**

Presents concepts of layout and their relationships to finished art. Also studies use of various media and materials.

**1841 Airbrush Photo Retouching****2**

Offers studio projects in photo retouching, from light to cut-away retouching techniques.

**1842 Layout Design Techniques I****2**

Demonstrates drawing, composition, and layout techniques as applied to brochures, ads, and direct mail projects.

**1843 Life Drawing Anatomy****2**

Studies anatomical renderings of the skeletal-muscular formations of the torso, limbs, and cranial areas of the human body.

**1845 Life Drawing Techniques I****2**

Offers intensive studio work in life drawing, with emphasis on the use of the human figure in illustration.

**1847 Keylining Fundamentals I****2**

Demonstrates the preparation of art for printing.

**1850 Layout Design Fundamentals II****2**

Studies concepts of layout design and techniques of visualization as they pertain to format, reproduction and finished art.

**X 1851 Illustration Concentration I****3**

Develops skills in a selected area of illustration through studio projects designed by the instructor and students.

- 1853 Figure Rendering** **2**  
Offers studio projects in the rendering of the human figure as used in illustrations.
- 1854 Layout Design Techniques II** **2**  
Applies layout concepts in single to process color visuals, using rough, semi-comprehensive, and comprehensive techniques.
- 1855 Creative Illustration Concepts** **2**  
Studies visual techniques, including vignetting, resist impasto, flat pattern, and scale, with emphasis on the position of elements on the illustrative field.
- 1856 Creative Illustration Methods** **2**  
Consists of studio projects in high design using creative techniques.
- 1857 Figure Drawing for Layout** **2**  
Studies the execution of draped and undraped figures to achieve lifelike situation visuals for layout.
- 1858 Storyboard Techniques** **2**  
Studies storyboards as visual tools for 35mm and TV formats. Attention given to field size and position and to quality of visual techniques.
- 1859 Illustration Concentration II** **3**  
Consists of illustration projects selected and designed by students and professionals, with emphasis on quality, completion time, and suitability. Students will execute the projects, where possible, under the direction of a field professional.
- 1860 Keylining Techniques I** **2**  
Develops techniques in keylining, with emphasis on time and halftone art requirements for reproduction.
- 1861 Storyboard Concepts** **2**  
Consists of studio projects in multifield sizes, sequencing and value, and chromatic alignment.
- 1869 Darkroom Processes** **2**  
Studies photographic processes, chemicals, and paper.
- 1870 Keylining Fundamentals II** **2**  
Studies keylining in relation to mechanical specifications, camera-ready preparation, and multiple-page signatures.
- 1871 Audiovisual Art Design** **2**  
Studies the preparation of charts, graphs, flip charts, transparencies, and slides used in the audiovisual communication processes. Includes lectures, discussion, and projects.

- 1872 Keylining Techniques II** **2**  
 Consists of studio projects in two-Band four-page signatures with all live visuals in position.
- ✓ **1873 TV Art Design** **2**  
 Studies the execution of art produced for direct or slide use on TV, with emphasis on chron and value alignment and field size and organization.
- 1875 Fashion Illustration** **2**  
 Presents concepts and exercises in line and wash figure illustration for newspaper and magazine use.
- 1881 Technical Illustration** **2**  
 Presents concepts and techniques relating to technical illustration, with emphasis on detail configurations and visual clarity. Special attention given to ultraways and exploded views.
- 1883 Specialized Layout Concepts** **2**  
 Studies layout techniques specific to catalogs, house organs, annual reports, and similar publications, with special emphasis on continuity and suitability of format.
- 1884 Specialized Layout Techniques** **2**  
 Consists of studio projects in the design and layout of specialized publications. Stresses concept continuity, efficiency of space utilization, and practicality of production.
- ✓ **1885 Portfolio Preparation I** **3-5**  
 Assists the student in the preparation of a portfolio for job interviews. Covers evaluation, finishing and scheduling processes.
- 1886 Portfolio Preparation II** **3-5**  
 Assists the student in the execution and finishing of art work for the portfolio. Includes discussion of contents to correct any remaining weaknesses.
- 1898 Seminar on Advertising Media I** **3**  
 Offers credit hour awards for participation in the planning and production of the annual meeting of SAM.
- 1899 Seminar on Advertising Media II** **3**  
 A continuation of Seminar on Advertising Media I (1898).
- 1901 Introduction to Audio Production** **2**  
 Demonstrates intermediate techniques in audio scripting, recording, editing, and duplication using reel-to-reel and cassette equipment.



- 1902 Video Production I—Prerequisite: 1942** **3**
- Concentrates on the planning and execution of a video tape production. Includes continuity and shooting to accommodate post- production titling and editing. Attention given to the lighting and micing of a television set.
- 1903 Video Production II** **3**
- Introduces techniques used in a multi-camera studio television production, with attention to different types of lighting, coordination of sound systems to video, and functions of personnel to various studio tasks.
- 1904 Audiovisual Electronics** **2**
- Presents electronic theory, principles, and practices as applied to audiovideo equipment and still-frame systems.
- 1905 Video Systems Design** **2**
- Demonstrates how to design an editing and production system for color video tape production, how to produce color video to script instructions, and how to master a finished video tape utilizing 3/4" heterodyne color systems and time code editing and mastering techniques.
- 1906 Script Writing for TV I** **2**
- Provides exercises in the writing of production and content scripts for videotaping. Students will produce scripts oriented to specific markets, such as public information, industrial training, or educational instruction.
- 1907 Script Writing for TV II—Prerequisite: 1906** **2**
- Teaches advanced techniques in scriptwriting for television, with focus on organization of content, camera instructions, talent queues, shooting lob, and taping sequencing.
- 1908 Color Slide Production** **3**
- Introduces 35mm photography for multi-image production.
- 1909 Kodalith Slide Production** **3**
- Demonstrates how to make line film negatives from black and white artwork and line conversions from continuous tone originals.
- 1910 Audio Recording for Slide Production** **2**
- Teaches techniques of producing finished audio tapes, using narrative, sound effects, and background music. Special emphasis placed on still-frame pacing.
- 1911 Multi-Image Design** **3**
- Outlines the planning required to produce a 35mm multi-image slide show. Studies the visual imagery needs, sequencing of the image, supportive sound, and the techniques used in microprocessor system programming.

- 1912 Multi-Image Slide and Sound Production** 4
- Demonstrates how to program a multi-projector, multi-image slide presentation with supportive audio narrative, special effects, and music. The student will produce slides and finished audio tapes for a slide program.
- 1913 Advanced Color Video Production—Prerequisites: 1983, 1984** 4
- Studies advanced techniques of color video tape production, lighting, and control. Includes production staff assignment, coordination of personnel, production costing, and post production techniques. Special attention given to the use of direct color video systems for mastering, editing, and duplication of working tapes.
- 1914 Advanced Audio Production** 2
- Studies techniques used in multiple miced audio recording. Includes theory and practice of acoustical principles. Demonstrates special effects editing and overdubs for producing finished audio tapes.
- 1923 Mathematics for AV Technicians** 3
- Focuses on practical mathematics, including measurements, weights, ratios, and percentage.
- 1931 Script Writing I - Systems Design** 2
- Provides study and project exercises in AV systems selection and design for specific users.
- 1932 Script Writing I - Slide Presentation** 3
- Develops skills in organizing subject content and semantics of message vocabulary as used in narrative scripts for audio tapes.
- 1942 Introduction to Videotape Production** 3
- Provides exercises in the production of 1/2" black and white VTR tapes. Students will produce finished VTR tapes with "live" voice, voice-over, titles, and signatures. Students will also conduct VTR taping of evaluative feedback exercises.
- 1951 AV Systems for Industry** 3
- Covers design and systems setup for industrial use, with emphasis on in-house training, PR utilization, and personnel evaluative systems.
- 1953 Color Videotape Production** 3
- Presents techniques in color videotape production, with special emphasis on color balance, multiple camera and microphone systems, voice and music mixing, deck-to-deck editing, and titling. Projects include both studio and location tape production.
- 1960 AV Production Cost Estimating** 2
- Offers study and exercise in cost analysis as it pertains to the production of AV software.

- 1961 Videotape Editing** **2**  
Offers projects in video editing, entailing multiple image and audio manipulation.
- 1962 Message Design** **4**  
Studies principles and methods of psychology as applied to message design. Student projects dealing with signs, signals, and symbols serve as exercises to demonstrate uniform group comprehension. Explores both visual and audio media.
- 1963 Sound Recording and Editing** **3**  
Offers practical exercises in sound system design, including microphone types, transducers, editing, and mixing on single track tape.
- 1972 Motivating Psychology** **3**  
Studies principles and methods of psychology. Students will apply their understanding of motivational principles to projects designed to elicit predictable audience reaction and behavior.
- 1973 AV Systems for Government and Education** **2**  
Covers design and systems setup for government and educational use, with emphasis on in-house training, PR utilization, and personnel evaluation systems.
- 1982 Video Systems Maintenance** **4**  
Offers training and practical experience in light maintenance and repair procedures for VTR decks, camera, and sound systems.
- 1983 Special Effects in Color** **4**  
Focuses on special effects in photography and TV media.
- 1984 Advanced VTR Production** **4**  
Guides the student in producing a finished videotape with live broadcast capabilities and quality. Covers scripting, titling, editing, sound and video mixing, and both studio and externalized taping.
- 1985 Multitrack Sound Systems and Special Effects** **3**  
Presents projects in sound system design. Attention given to special effects, such as echo, reverb, and dolby.
- 1986 Advanced Maintenance Procedures** **4**  
Offers study and exercises in the maintenance and repair of all types of AV equipment.
- 1988 Sound Recording and Editing** **3**  
Offers practical exercises in sound system design, including microphone types, transducers, editing, and mixing on single track tape.

**1989 Audiovisual Equipment Utilization And Maintenance 2**

Provides exercises in setup, tear-down, storage and light maintenance of AV systems such as 16 mm movies projection systems, VTR recording and playback systems, O.H.P. systems, and audio recording and playback.

**2010 Composition and Design I 3**

Studies the basic elements of two-dimensional design and their use in creative work in interior design. Also studies principles of drawing flat elevations.

**2011 Color Theory 3**

Includes intensive study of color theory, with emphasis on expression, range, key, and color psychology. Explores the effects of living with color on the individual and the family. Applies practical solutions to problems concerning the use of color.

**2012 History of Art I 3**

Surveys art from prehistoric times through the Rococo period, placing the major periods of art history in sociocultural context. Attention given also to art as it relates to the artist and society.

**2013 Fundamentals of Structural Design I 4**

Studies fundamentals of drafting and use of the drafting equipment and building materials used in architectural structures.

**2018 History of Art II 3**

A continuation of History of Art I (2012). Studies painting and sculpture, with emphasis on architecture from the Rococo period to the present.

**2020 Composition and Design II 3**

Covers 3-dimensional concepts pertaining to perspective drawings. Teaches how to execute renderings of actual rooms for presentation to clients.

**2021 Textiles I 3**

Studies textile fibers, weaves, finishes, yarns, and dyeing processes, demonstrating how each is used by the professional designer.

**2022 Fundamentals of Interior Design I 3**

Introductory level study of window treatment, coverings, wall treatments, lighting, accessories, architectural and furniture styles, and the elements and principles of design.

**2023 Fundamentals of Structural Design II 3**

Students design and draw blueprints for a residential structure of their choice.

**2031 Textiles II 3**

Emphasizes textiles as used in the field of interior design. Covers physical properties and characteristics of carpets, wall coverings, upholstery, and draperies.

*all required materials to estimate to.*

- ✓ **2032 Furniture Styles I** 3  
 Surveys the development of furniture styles and interior design from ancient times through the Rococo period.
- 2033 Furniture Styles II** 3  
 Surveys the development of furniture styles and interior design from the Rococo to today. Continuation of Furniture Styles I (2032).
- ✓ **2041 Furniture Selection** 3  
 Teaches students to recognize quality furniture through study of construction techniques. Identifies furniture types and details, furniture woods as to color and graining, and common size standards for various pieces.
- 2042 Advanced Textiles** 4  
 Examines problems in estimating and installing carpet, drapery, and wall coverings. Students research and execute textile projects for class presentation.
- 2044 Environmental Psychology** 4  
 Emphasizes the relationship between the individual and his immediate and extended surroundings. Explores ways in which the five senses, especially sight, affect our perception of comfort.
- 2050 Applied Interior Design I** 4  
 Case studies with residential application provide experience for the student in resolving problems by means of cost and time accounts and purchase orders.
- 2051 Display I** 3  
 Studies the principles of display and the special techniques and equipment required in display work.
- 2052 Professional Practices** 3  
 Deals with the business aspects of the interior design profession. Topics discussed include business and legal paperwork, the formation of the organization, client job files, and ordering procedures.
- 2053 Furniture Arrangement and Space Planning—Prerequisites: 2013, 2022, 2041** 3  
 Analyzes existing conditions of interiors and applies practical solutions, using basic floor plans and assigned furnishings. Students progress to more advanced floor plans and designs.
- 2055 Environmental Design** 2  
 Studies environmental factors as they relate to human performance, behavior, and comfort. Students design interiors with attention to sound, natural and artificial light, traffic flow, heating, cooling, and visual aesthetics.
- 2057 Custom Textiles and Furniture** 3  
 Studies processes, costs, and techniques associated with custom furnishings.

such as silk-screened fabrics, woven rugs, limited production upholstery fabrics, and custom-made cabinets and furniture. Students execute experimental projects in silk-screened fabrics and simple furniture designs.

**2060 Applied Interior Design II—Prerequisite: 3050** **4**

Provides field experience in solving problems in interior design. Emphasizes application of previously learned principles and techniques of creative display to problems in case studies.

**2061 Display II** **3**

A continuation of Display I (2051).

**2062 Salesmanship** **3**

Surveys sales of and selling techniques for services and products. Covers all phases of selling, including approach, demonstration, close, and departure.

**2063 Space Planning - Commercial** **2**

Offers student projects in commercial planning, with attention to personnel task performance, traffic, environmental control, wear and maintenance, and budget cost control. Covers fixtures, retail management, store services, marketing, merchandising, and pricing.

**2064 Merchandise Buying Techniques** **2**

Covers management organization procedures, quantity buying as opposed to individual buying, source discounts in stocking and non-stocking dealerships, and purchasing for the individual client and walk-in trade.

**2070 Space Planning - Production** **2**

Studies production space-planning techniques for all types of manufactured housing. Covers floor plans, mass production, capabilities of design, visual alterations of home without major structural changes, materials selection versus quantity purchasing and volume, and amortization of special design features; also code requirements, anticipated life span of the structure, and wear use factors for specialized structures.

**2071 Lighting Techniques** **3**

Studies the techniques and special effects of lighting relevant to all aspects of interior design.

**2072 Installation Procedures—Prerequisites: 2022, 2042** **2**

Studies specifications for interior materials and methods of installation.

**2073 Kitchen and Bath Planning—Prerequisite: 2013** **2**

Studies space requirements and standard cabinetry for kitchen and bath.

**2074 Office Landscaping** **3**

Studies space planning based on flexible systems to accommodate changing commercial needs.

- 2210 Type Composition for Reproduction** 2  
Introduces photo typesetting, stressing operations and the capabilities of the equipment to produce materials.
- 2211 Art and Copy Preparation** 2  
Covers basic principles of layout and design and the use of various tools, materials, and equipment for different types of layout.
- 2212 Layout and Stripping Flats** 2  
Provides instruction and practice in the basic operations involved in layout and stripping flats for black and white reproduction work. Covers use of various tools, materials, and equipment.
- 2213 General Printing Processes** 2  
Focuses on operations preceding and following press work, including the preparation of inks, fountain solution, and other supplies used by the printer, and the use of bindery equipment on the finished product.
- 2214 Camera Fundamentals** 2  
Provides instruction in the operation of process cameras, emphasizing line photography techniques. Offers practice in the fundamentals of camera and darkroom procedures.
- 2215 Plate Making Fundamentals** 2  
Covers fundamentals of plate processing and development. Offers practice with the tools, materials, and equipment used by the plate maker.
- 2216 Offset Presswork Fundamentals** 3  
Provides instruction and practice in operational procedures for the common small press duplicators used in black and white offset presswork.
- 2221 Camera-Line and Halftone** 2  
Covers methods and techniques of transforming continuous tone copy into printable halftones. Also provides understanding of densitometry, halftone computer wheels, screens, screen ranges, flash exposures, effects of highlights, and show range. (Requires experience in line negative work).
- 2222 Stripping Line and Halftone Negatives** 2  
Presents different methods of stripping line and halftone combinations. Also includes double burns, step and repeat, work and turn, register systems, and mechanical color.
- 2223 Photo Offset Fundamentals** 2  
Offers students hands-on experience with the larger duplicating presses used in photo offset work. Gives a thorough grounding in offset fundamentals.

- 2224 Printing Estimating** **3**  
Teaches the student how to estimate the cost of printing jobs. Includes handling of customer requests and computing costs of paper, typesetting, press, and binding.
- 2225 Offset Presswork I** **3**  
Offers experimental presswork relating halftones, register work, work and turn, and mechanical color printing. Stresses accuracy in all phases of operation.
- 2231 Advanced Camera** **2**  
Trains students to shoot negatives of mechanical color for 3-, 4-, or 5-color work. Stresses register of all work. Students are expected to handle any camera work given them at this time.
- 2232 Offset Presswork Operations** **2**  
Completes material begun in Offset Presswork I (2225) with special care taken in press set.
- 2233 Offset Presswork II** **3**  
Develops neatness and accuracy in ink coverage and registry of each sheet printed. Students are expected to handle work of longer duration on any type of duplication in the lab.
- 2240 Special Effect Camera Work** **2**  
Covers duotones, special effect screens, shooting techniques, and film development. Students are encouraged to experiment with special effects under the guidance of the instructor.
- 2241 Printing Production Practice** **2**  
Introduces students to the preparation, cleaning, and operation of the press.
- 2242 Press Troubleshooting** **2**  
Demonstrates how to detect and correct malfunctions to insure uninterrupted press runs. Emphasis on the correct setting of damping and inking systems, pull-out roller, stop fingers, and feed rollers.
- 2243 Offset Presswork III** **3**  
Offers experience in full production runs, using the larger presses of the printing laboratory.
- 2244 Ink and Paper for Offset** **2**  
Discusses the manufacture of ink and paper and the problems arising from their different properties. Includes identification of papers and mixing of ink.
- 2251 Special Problems in Offset Preparation** **3**  
Covers activities and responsibilities specifically related to printing, including supervision of workers in the printing field. Special projects are designed to help students in any areas of deficiency.



## **2252 Manufacturing and Organization 3**

Studies the duties of the first-line supervisor and other management personnel and problems of management encountered in a manufacturing organization. Covers the establishment of lines of authority, duties, and responsibilities, and the rules for charting an organizational structure. Also reviews manufacturing, engineering and research, industrial engineering, materials management, process and product control, facilities planning, plant engineering, and manufacturing information systems.

## **2253 Supervision I 3**

Studies management and supervision, including responsibilities of the supervisor, functioning within an organizational structure, communications, motivation, delegation of authority, interviews, orienting and inducting new employees, and evaluation of employee performance.

## **2254 Supervision II 3**

Covers written and oral communications with emphasis on preparation and presentation skills.

## **2255 Printing Specialization 4**

Allows students to develop in individual areas of printing technology.

## **2262 Production Control 3**

Develops the ability to oversee a number of operations at one time in a typical print shop. Introduces inventory controls, ordering of equipment, and vendors' catalogs.

## **2263 Introduction to Photo Typesetting 3**

Teaches basic phototypesetting concepts and terms and the operation of a phototypesetter. Students perform all the typesetting formats within the capability of the machine.

## **2264 Preventive Maintenance 2**

Develops preventive maintenance programs for all areas of printing. Demonstrates how to establish maintenance schedules and to check for wear. Also outlines the supplies and equipment necessary to perform in-depth maintenance.

## **2415 Audiovisual Equipment Operations and Maintenance 3**

Demonstrates the operation of various types of AV equipment and basic maintenance for hardware items.

## **2417 Library and Learning Resource Center Fundamentals I 3**

Presents a general introduction to all major phases of library and learning resource center operations, especially as they pertain to the role of "library aides". Includes library history and systems, organizational patterns, technical and public services, and media systems.

**2418 Library and Learning Resource Center Fundamentals II****3**

Introduces the types of library materials and their organization, characteristics and use in support of the library's function. Emphasizes reference service and a thorough knowledge of standard reference tools.

**2419 Library Forms and Records****3**

Introduces standard forms and methods of record keeping related to such library functions as shelf listing, serials control, and filing.

**2427 Library Operations and Practices—Prerequisite: Typing II****5**

Prepares the student to perform service operations and to meet the service demands of patrons. Offers practical experience in a broad range of library tasks, including circulation and reference services, vertical file maintenance, and displays.

## **HEALTH OCCUPATIONS**

**2601 Introduction to Child Care****4**

Offers a basic introduction to child care. Includes theories of discipline, parent problems, self-concepts, and the development and scheduling of a child care program.

**2610 Child Growth and Development****4**

Introductory study of the physical, social, emotional and mental development of the pre-school child. The influence of cultural environment on development and individual differences in development are considered.

**2611 Group Care of Children****3**

Covers role, duties, and responsibilities of the child care center staff; the primary objectives, goals and responsibilities of a center; and the basic value structure, setting, organization, and programming of child care facilities.

**2612 Childhood Health****4**

A basic health and first aid course pertaining to early childhood.

**2613 Orientation to Child Care Seminar****4**

Acquaints students with fundamentals of child care, including teaching the younger child, working with parents, and the role of the kindergarten and day care center.

**2623 Cognitive and Creative Activities for Children****3**

Studies the cognitive and creative activities of young children. Includes analysis of play situations appropriate to the needs and abilities of three to five-year-old children; also includes instruction and practice in teaching and supervising the cognitive and creative activities of young children.

**2624 Child Care Participation I****4**

Provides opportunity for practical experience through observation and supervised participation in child care agencies.

- 2625 Legal Aspects of Child Care** **3**  
 Studies professional organizations, child care laws, licensing requirements, and ethical and legal responsibilities of the child care team. Also informs the student of educational resources and in-service programs relevant to the child care team.
- 2626 Science and Social Studies - Preschool Children** **4**  
 Instructs aides in preschool education methods in the areas of science and social studies.
- 2627 Child Care Seminar I** **2**  
 A companion course to Child Care Participation I (2624), with emphasis on the application of child care and development theories.
- 2631 Child Care Participation II** **4**  
 Continuation of Child Care Participation I (2624) with a change of center and supervising teacher.
- 2633 Community Resources** **4**  
 Develops good working relationships with parents and employers and with leaders and members of the community. Teaches the student how to make effective use of community resources.
- 2637 Child Care Seminar II** **2**  
 A companion course to Child Care Participation II (2631), with emphasis on application of child care and development theories.
- 2641 Childhood Movements and Creative Activities** **4**  
 Teaches the student to recognize normal motor development in preschool children and to devise creative and constructive activities that encourage growth of motor skills.
- 2642 Nutrition and Meal Planning** **4**  
 Focuses on the nutritional needs of preschool children and the state regulations for feeding programs in child care centers. Demonstrates ways to instill nutritional values in preschool children.
- 2643 Preschool Art** **4**  
 Presents the methods, techniques, and materials used in art education for young children.
- 2645 Child Care Participation III** **4**  
 Continuation of Child Care Participation II (2631) with a change of center and/or supervising teacher and age group of children.
- 2647 Child Care Seminar III** **2**  
 Continuation of Child Care Seminar II (2637).

- 2651 Language Arts for Children** **4**  
Presents methods and techniques useful in the development of language skills in preschool children.
- 2654 Child Care Participation IV** **4**  
Continuation of Child Care Participation III (2645).
- 2655 Bookkeeping** **4**  
Introduces principles of bookkeeping pertaining to the medical office. Includes debit and credit, double entry bookkeeping, use of ledgers and journals, transaction analysis, posting procedures, cash basis of accounting, handling petty cash, banking procedures, payroll, depreciation of accounts, balance sheets, work sheets, and income statements.
- 2657 Child Care Seminar IV** **2**  
A continuation of Child Care Seminar III (2647) with emphasis on improvement of children's communication skills and management of behavior problems.
- 2660 Preschool Music** **4**  
Instructs in the planning of musical activities for preschool children. Includes use of songs, records, and simple instruments for group activities. Laboratory work with children is included in the program.
- 2661 Management Techniques** **4**  
Presents the principles of management of a child care agency. Emphasizes the role of the manager in relation to agency personnel, housekeeping, maintenance requirements.
- 2663 Audiovisual Materials and Methods** **4**  
Introduces audiovisual equipment, techniques, and materials used in the preparation of group programs.
- 2665 Child Care Participation V** **4**  
A continuation of Child Care Participation IV (2654).
- 2667 Child Care Seminar V** **2**  
A continuation of Child Care Seminar IV (2657).
- 2701 Physical Care** **4**  
Introduces basic nursing techniques in the mental health field. Includes administration and preparation of medicine, client programming, and first aid. Emphasizes responsibilities, identification of symptoms, and record-keeping.
- 2702 Behavioral Management I** **4**  
Presents principles of behavior management, techniques of positive reinforcement and behavior shaping, contracting, measurement, task analysis, and application of client programming.

- 2703 Introduction to Human Services** **3**  
 Introduces human service concepts and provides basic knowledge of the profession.
- 2704 Introduction to Human Services** **3**  
 Introduces concepts of human services and provides a basic knowledge of the profession.
- 2710 Clinical I** **5**  
 Supervised experience in the techniques of client treatment. Includes observation and participation.
- 2711 Physical Systems 1** **4**  
 Deals with the physical care of clients within a unit. Studies muscular patterns, body systems, seizures, and first aid.
- 2712 Behavioral Management II** **4**  
 Examines personalities, attitudes, behavior, and reactions of clients. Attention also given to client relationships, normalization, and participation in outside activities.
- 2713 Human Growth and Development I** **4**  
 Introduces cognitive, social, and psychological theories of human development from the prenatal period through the adolescent years.
- 2714 Human Growth and Development II** **4**  
 A continuation of 2713. Studies human development from the adolescent years through later adulthood. Includes adjustment to the roles of adulthood, the aging process, and death and dying.
- 2715 Evaluation and Assessment** **2**  
 Discusses the rationale for assessment, assessment techniques, and evaluation methods. Offers practice in the techniques used to acquire mental health data.
- 2716 Information Management** **2**  
 Introduces and develops skills in obtaining, organizing, disseminating, and evaluating mental health information essential to work in the field. Attention given to client data, statistical information, and record-keeping necessary for appropriate treatment.
- 2717 Special Populations** **3**  
 Surveys handicapping conditions stemming from dysfunction, illness, and needs of special populations and individuals.
- 2720 Clinical II** **5**  
 A continuation of Techniques of Client Treatment Clinical I (2721).

- 2721 Physiology of the Aging Process** **4**  
 Develops an understanding of the physical and psychological changes that occur with aging. Outlines the necessary adaptations in nursing techniques, approaches to treatment, and patient environment.
- 2730 Clinical III** **5**  
 A continuation of Techniques of Client Treatment Clinical II (2720).
- 2731 Program Rationale for Client Treatment I** **2**  
 Provides an overview of the approach to client treatment. Includes organization of the program, entry behavior, sequential development, evaluation, attitude, and expectations of staff.
- 2732 Program Rationale for Client Treatment II** **2**  
 A continuation of 2731.
- 2733 Current Issues In Mental Health** **3**  
 Defines Mentally Retarded/Developmentally Disabled and examines current issues and resources relating to client treatment. Issues include Public Law 158, client rights, advocacy, right to treatment, accreditation, evaluation and documentation, least restrictive alternative, normalization, accountability, and problem-oriented record.
- 2734 Residential Management** **4**  
 Studies the structure of the client living unit and methods of providing efficient service to the individual client. Includes management of staff, span of control, scheduling, rhythm of life, practical application of normalization, client interaction, and assessment.
- 2741 Developmental Model** **4**  
 Examines normal, abnormal, and delayed patterns of human development. Attention given to the work of Piaget and Ericson.
- 2742 Task Analysis** **4**  
 Presents the sequential nature of performance and an analysis of the elements that compose a wholly learned task. Includes methods of task analysis, forward and backward chaining, and whole task learning. Introduces applications of task analysis to client treatment.
- 2743 Legal Aspects** **4**  
 Applies the least restrictive alternative and Public Law 158 to resident programming, including J.C.A.H. accreditation. Explains treatment procedures available from policy B-11, including extinction, over-correction, and restrictive techniques, and the legal and ethical considerations of each.
- 2745 Normalization** **4**  
 Uses Dr. Wolf Wolfenberger's principles of normalization and the P.A.S.S. method of evaluation of service delivery systems to assess the degree to which the normaliza-

tion principle is applied to resident programming. Discusses philosophies and attitudes of normalization as they relate to the personal response of the trainee to a developmentally disabled population. Studies the phenomenon of institutionalization and approaches to deinstitutionalization for residents of mental health facilities.

#### **2751 Client Assessment and Documentation 4**

Presents the rationale and methods for client assessment and documentation and the tools needed to obtain client data. Demonstrates the phrasing of referral questions and techniques for the documentation of data effected in individual client assessment.

#### **2760 Therapeutic Recreation 4**

Analyzes recreation as therapy and studies modes of recreation included in client programming, adapting activities to individual needs, and specific teaching objectives. Gives attention also to gross and fine motor functioning and development and to additional therapy necessary to provide a basis for the therapeutic implementation of recreation.

#### **2761 Interdisciplinary Team 4**

Examines the concept of the interdisciplinary team, the involvement and expertise of the contributing disciplines, legal aspects, functions and mandates, and the work performed. Practice with simulated interdisciplinary teams offers participants practical experience in the design of residents' programs, monthly reviews, resident placement and follow-up.

#### **2762 Service Delivery Systems 3**

Describes funding sources, systems analysis, community agencies, and the interrelationships of organizations providing services to the developmentally disabled. Offers an integrated approach to service delivery. Also includes study of the zone system and specialty facilities.

#### **2763 Advanced Individual Programming 4**

Continues study of the concepts presented in applied behavioral psychology. Describes individual programming techniques, philosophy, rationale, and methods of implementation. Offers supervised practice in individual programming.

#### **2770 Accreditation Standards and Certification 4**

Discusses individual staff accountability, group staff evaluation, and professional ethics pertaining to the intermediate care facility. Studies assessment methods for application to accountability as provided by the Joint Commission for Accreditation of Hospitals.

#### **2775 Supervision 4**

Covers styles of supervision and methods of directing, utilizing and delegating human resources. Offers practical experience in simulated situations. Covers personnel policies and rights of employees.

#### **2811 Fundamentals of Laboratory Techniques 4**

Introduces elementary skills required in the medical laboratory.

- 2813 Immunohematology Techniques** **4**  
 Studies principles, practices, and laboratory techniques pertaining to the blood bank.
- 2814 Routine Analysis Techniques** **4**  
 Studies principles practices, and clinical laboratory techniques associated with the routine analysis of body fluids.
- 2820 Hematology Techniques** **8**  
 Presents principles, practices, and laboratory techniques associated with hematology and coagulation.
- 2821 Blood Banking Applications - Immunohematology** **2-6**  
 Studies clinical laboratory blood bank procedures, including detection of blood group system antigens and antibodies, donor screening, hemolytic disease of the newborn, and processing and recommendations by the American Association of Blood Banks.
- 2822 Routine Analysis Applications** **1-6**  
 Studies the clinical applications of routine analysis in the hospital laboratory.
- 2823 Microbiology Techniques** **6**  
 Studies the principles, practices, and laboratory techniques associated with microbiology. Includes classification and identification of microorganisms.
- 2829 Parasitology and Mycology Techniques—Prerequisites: 9353, 9354, 2811, and 2823** **2**  
 Continues with the isolation and identification of rarer pathogenic bacteria and anaerobes. Introduces the collection and processing of specimens and the isolation and identification of fungi, parasites, and mycobacterium.
- 2830 Chemistry Techniques** **8**  
 Studies the principles, practices, and laboratory techniques associated with clinical chemistry.
- 2831 Hematology Applications** **4-6**  
 Studies hematological tests and the principles and laboratory techniques associated with hematology and coagulation.
- 2832 Immunology Techniques** **4**  
 Concentrates on serological tests and the principles and laboratory techniques associated with immunology and serology.
- 2840 Chemistry Techniques** **8**  
 Offers practice in routine chemical analysis in the medical laboratory.



## **2841 Microbiology Applications** **4-6**

A study of the applications of microbiology and the clinical practices in hospital laboratories.

## **2842 Immunology Applications** **1-6**

Studies the applications of serology in the hospital laboratory.

## **2851 General Chemistry** **3**

Studies matter in all forms and reactions. Includes basic concepts of atomic structure, bonding, equilibrium, acid-base chemistry, solutions, and chemical calculations. Also introduces principles of organic chemistry and biochemistry.

## **2860 Advanced Chemistry Techniques** **2**

Examines the biological functions of cellular constituents, including carbohydrates, proteins, lipids, nucleic acids and enzymes. Also studies the metabolic processes in the human body.

## **2863 Instrumentation** **3**

Presents instrumentation theory and practice as applied to electronic equipment and automated systems in the medical laboratory.

## **3001 Introduction to Dental Practice** **2**

Presents the objectives, qualifications, responsibilities, and scope of the services of the dental assistant. Covers history of the field and legal aspects pertaining to the assistant as a member of the dental health team. Stresses terminology relevant to the field.

## **3003 Dental Materials and Laboratory I** **4**

Acquaints the student with the properties and behavior of dental materials, the proper mode of manipulation, the necessary armamentarium used, and the technical duties of the dental assistant.

## **3007 Preclinical Practice I—Prerequisite: Permission of the program supervisor.** **5**

Introduces the dental operator and responsibilities of the dental assistant, including housekeeping, assisting the doctor, patient care, equipment and instrument identification, instrumentation, tray setups, effective teamwork, 4-handed dentistry, operative dentistry, and sterilization procedures. Emphasis on practice sessions and relevant terminology.

## **3008 Dental Anatomy—Prerequisite: 3007** **4**

Acquaints students with oral, head, and neck anatomy, basic embryology, histology, and tooth morphology as they relate to the dental field. Emphasis placed on knowledge of materials and terms. Incorporates drawing and carving of teeth to develop students' hand and finger dexterity.

**3009 Health Office Communications****3**

Practices the oral and written communication skills used in medical offices and clinics.

**3010 Dental Materials and Laboratory II****4**

Continues Dental Materials and Laboratory I (3003).

**3011 Preclinical Practice II****5**

Continues Preclinical Practice I (3007). Presents anesthesia and the following specialties: oral surgery, endodontics, periodontics, pedodontics, orthodontics, prosthodontics, and public health.

**3012 Oral Pathology/Microbiology****4**

Introduces basic concepts of microbiology, with emphasis on oral microflora. Presents pathogenic problems of the oral cavity, emphasizing signs, symptoms, and prognosis of disease processes. Also includes laboratory experiments permitting observation of organisms.

**3013 Preventive Dentistry/Diet and Nutrition—Prerequisites: 3001, 3008****3**

Acquaints students with the importance of preventive dentistry. Emphasis placed on the effects of diet and nutrition. Teaches techniques of assisting patients in the maintenance of good oral hygiene.

**3034 Dental Radiography****5**

Covers basic principles, benefits, effects, and control of X-ray production. Includes history, radiation sources, modern dental radiographic equipment and techniques, anatomical landmarks, and dental films and processing.

**3038 Clinical Practice I****3**

Applies manual skills and knowledge of dental materials and clinical procedures in a simulated office situation with real patients.

**3039 Dental Office Management—Prerequisite: 3011****4**

Presents principles of administrative planning, bookkeeping, filing, recall programs, banking, tax records, basic written communications, insurance office practice, and management as related to the dental office. Stresses techniques pertaining to appointment control, record-keeping, and credit and payment plans.

**3044 Clinical Practice II****11**

Provides chairside dental assisting experience in private dental practices in general and specialized areas of dentistry. Includes weekly seminars as an integral part of the learning experience.

**3215 Orientation to Emergency Medical Services****5**

Acquaints students with basic principles of nursing and emergency medical care. Includes familiarization with the hospital environment.

- 3220 Emergency Medical Technician - Ambulance** 5-7  
 Develops basic skills in areas of emergency care in ambulance operation, including pulmonary depression and arrest, cardiac arrest, bleeding and shock, sterile techniques, and management of acute medical and psychiatric problems. Presents principles concerning the emergency care of wounds, burns, and environmental and orthopedic injuries.
- 3221 Basic Cardiology** 4  
 Presents fundamentals of the cardiology system. Includes instruction in cardiophysiology, pathology, electrocardiography, and principles of cardiac monitoring.
- 3222 Basic Cardiology and Respiratory Function** 4  
 Develops skills in performing an electrocardiogram and in interpreting basic cardiac arrhythmias. Introduces respiratory therapy and physiology, thereby preparing the student for further education and hospital employment.
- 3247 Basic EMT Refresher Course—Prerequisite: 3219** 2  
 Offers theory and laboratory practice needed to update emergency medical technician-ambulance skills.
- 3248 Basic Life Support Concepts and Skills** 3  
 Provides the knowledge for security personnel, hospital employees, allied health workers, business office personnel, and interested persons in industry to render emergency care at an accident site prior to the arrival of professional emergency medical technicians.
- 3249 EMT-A Refresher** 3  
 Reviews and renews the skills of emergency medical technicians who have successfully completed basic training in Emergency Medical Care.
- 3410 Introduction to Catering** 4  
 Offers guidance to the novice or established caterer in starting or improving a business.
- 3411 Introduction of Culinary Arts** 2  
 Presents the history and development of the food service and hospitality industry.
- 3413 Introduction to Foods** 2  
 Surveys the food products used in the food service and hospitality industry.
- 3415 Introductory Baking** 3  
 Presents the fundamentals of baking science and technology, with emphasis on ingredients and preparation.
- 3416 Culinary Theory and Skills Development** 3  
 Presents concepts, skills, and techniques of basic cookery.

- 3417 Pantry and Breakfast Cookery** **2**  
Presents the fundamentals of pantry, garde manger, and breakfast cookery.
- 3419 Culinary Art Externship I** **3**  
Includes nine hours per week of work experience in commercial food establishments.
- 3421 Nutrition** **3**  
Explores the relationship of food and nutrition to optimal physical fitness. Studies individual daily needs for protein, vitamins, and minerals and the food sources that supply them.
- 3423 Introductory Hot Food Preparation** **3**  
Introduces fundamental concepts and techniques of food preparation, with emphasis on basic menu items.
- 3425 Introductory Table Service** **2**  
Covers dining room service and supervision, including equipment, personnel, responsibilities, organization, customer relations, and table service.
- 3426 Purchasing, Storeroom Procedures, and Stewarding** **2**  
Demonstrates how to staff a storeroom and how to receive, store and issue merchandise. Emphasis placed on control and reporting procedures.
- 3427 Institutional Food Service Systems** **2**  
Provides training in the operation of a fast food facility. Emphasis placed on timing, cooking to order, portion control, management, and supervision.
- 3428 Intermediate Hot Food Preparation** **2**  
Studies concepts and techniques of hot food preparation. Develops culinary skills through daily production.
- 3429 Culinary Art Externship II** **3**  
Includes nine hours of work experience per week in commercial food establishments.
- 3430 Advanced Meat Cutting/Advanced Kitchen** **3**  
Studies advanced garde-manger techniques, such as aspic pates, chaud-froid, terrines, gelatines, and sauces and manipulation of tools. Also covers buffet table arrangement and organization and the use of meat cutting tools in an advanced kitchen program.
- 3431 Supervisory Development** **2**  
Discusses the basic skills and responsibilities of a supervisor.

### **3436 Advanced Baking/Classical Pastry** **3**

A continuation of Introductory Baking (3415), with emphasis on cake decorating and classical desserts.

### **3437 Wines/Spirits** **2**

Examines beverage control in food service establishments, with attention to purchasing, receiving, storing, and issuing procedures.

### **3438 Menu and Facilities Planning** **2**

Studies principles and concepts of menu planning, including menu formats and layouts.

### **3439 Culinary Arts Externship III** **3**

Includes nine hours of work experience per week in commercial food service establishments.

### **3440 International Food Preparation—Prerequisite: 3430 Advanced Meat Cutting/Advanced Kitchen** **3**

Instructs in the preparation of menus representative of different countries and cultures. Emphasizes Middle Eastern, Spanish, South American, German, Austrian, Swiss, Scandinavian, Belgian, and Dutch. Also introduces Chinese, Japanese, and Polynesian recipes. Attention given to utensils associated with these cuisines, including the wok, Chinese cleaver, smoke cabinet, swedish pancake skillet, paella pan, and tortilla press. Discusses and utilizes ingredients and procedures unique to each menu.

### **3442 Buffet Catering** **2**

Studies cold food preparation and presentation techniques, including charcuterie, specialty canapes, hors d'oeuvres, appetizers, pates, galantines, chaud-froids, terrines, tallow and ice carving, aspics, mousses, cold sauces, vegetable carving, food decoration. Also covers food materials utilization, buffet planning, layout, equipment, zoning, and services.

### **3444 Introduction to Food Service** **3**

Presents the history of various cuisines and the contributions of leading culinarians, providing a background for study of the food service industry. Examines different types of food service establishments and their organizational structures and discusses future trends.

### **3446 Food and Beverage Service** **3**

Studies types of dining service appropriate for coffee shops, dining rooms, banquets, and buffets. Covers liquor laws and the service of legal beverages.

### **3449 Food Specialties III—Garde-Manger II** **3**

Studies advanced garde-manger techniques, including aspic pates, chaud-froid, terrines, gelatines, and sauces and the manipulation of tools. Also covers buffet table arrangement and organization.

**3452 Food Service I****3**

Studies fundamentals of food preparation, service procedures and sanitation, and safety practices pertaining to food service. Attention given to management functions and controls.

**3454 Foods Service Specialty—Baking****3**

Introduces the preparation and use of yeast in breadmaking and pastries. Includes baking of pies, cakes, and tarts, the use of equipment, and sanitation practices.

**3455 Menu Design****4**

Plans menus to meet the requirements of various types of food service operations for different numbers of people. Includes principles and practices of pricing, ordering, conversion of recipes from small to large quantities, types of menus, public food preferences, and principles of nutrition.

**3456 Food Service Specialties II - Garde-Manger****3**

Studies special garde-manger techniques, including ice and tallow sculpturing, with emphasis on manipulation of tools. Students will also create buffet showpieces, such as watermelon baskets and table arrangements of fresh fruits and vegetables. Includes introduction to the art of pulled sugar.

**3459 Classical Cuisine and Banquet Organization—Prerequisite: 3430****3**

Presents advanced and sophisticated classical culinary methods, following the principles and techniques of Escoffier. Studies cooking techniques, timing, presentation, history, and terms relevant to classical foods and menus, with emphasis on French cuisine. Offers practical experience in table service operation, stressing kitchen coordination and timing. Covers legal considerations, sales planning, menu layout, floor plans, ceremonial functions (weddings, etc.), and off- and on-premise catering. Attention given also to kosher catering. Students will plan, prepare, and serve a graduation dinner.

**3461 A la Carte Food Preparation and Advanced Table Services—Prerequisite: 3425****3**

Includes study and preparation of a la carte menu items. Students follow the traditional European Brigade system.

**3462 Advanced Food Preparation and Banquet Service—Prerequisites: 3427 Institutional Food Service 3428 Intermediate Hot Food Preparation****3**

Offers advanced study of haute cuisine preparation and service. Includes a buffet presentation as a course project.

**3468 Classical Cuisine and Banquet Organization II****3**

A continuation of Classical Cuisine and Banquet Organization (3459). Studies in detail the planning and execution of classical menus. Includes additional menus prepared in instructed labs and lectures and class research on the writings of Escoffier and Careme.

**3470 Fish and Seafood Preparation****3**

Explains and demonstrates methods of butchering and the preparation of cold fish, shell fish, and mollusks. Provides opportunities for practice.

**3474 First Aid/Sanitation****2**

Provides a foundation in the field of food service sanitation. Topics include food microbiology, sanitation procedures, food protection principles, restaurant design, pest control, health inspection procedures, public health law, and first aid.

**3480 Culinary Arts Externship I****5**

Offers apprenticed cooks 30 hours per week of work experience in various local restaurants. Students will demonstrate their abilities and their understanding of a safe and orderly kitchen operation.

**3481 Culinary Arts Externship II****5**

Offers apprenticed cooks 30 hours per week of work experience in various local restaurants. The student will learn to select, prepare, and present assorted foods and to estimate the costs of food and labor.

**3482 Culinary Arts Externship III****5**

Offers apprenticed cooks 30 hours per week of work experience in various local restaurants. Studies different types of foods for various occasions.

**3483 Culinary Externship IV****5**

Offers apprenticed cooks 30 hours per week of work experience in various local restaurants. The student will learn the uses and preparation of cold meat plates and salads and hot sauces, gravies, and soups.

**3484 Culinary Arts Externship V****5**

Offers apprenticed cooks 30 hours per week of work experience in various local restaurants. Emphasis placed on the aesthetic uses, arrangement, and apportionment of garnishments, canapes, and hors d'oeuvres.

**3485 Culinary Arts Externship VI****5**

Offers apprenticed cooks 30 hours per week of work experience in various local restaurants. Emphasis placed on the preparation of and techniques for frying foods.

**3486 Culinary Externship VII****5**

Offers apprenticed cooks 30 hours per week of work experience in various local restaurants. Emphasis placed on the broiling of meats, fish, shellfish, and fowl.

**3487 Culinary Externship VIII****5**

Offers apprenticed cooks 30 hours per week of work experience in various local restaurants. Attention given to the preparation, seasoning, and apportionment of various kinds of rice and pasta.

**\*(See also Culinary Arts courses page 117)**

**3607 Nutrition and Diet Therapy 5**

Provides instruction in the fundamentals of nutrition, therapeutic diets, and menu planning and writing.

**3608 Dietary Management I 5**

Includes specifications, storage, purchasing, emergency feeding, sanitation, and safety in a format designed for food service employees or prospective employees of health care institutions.

**3609 Dietary Management II 5**

Continues the study of specifications, storage, purchasing and preparation of food. Also includes recipe standardization, kitchen designs, and delivery systems in a format designed for food service employees or prospective employees of health care institutions.

**3611 Diet Therapy 3**

Introduces principles of menu planning for therapeutic diets, medical terminology necessary to obtain information from patient care plans, and State Board of Health requirements relative to therapeutic diets.

**3612 Nutrition and Diet Therapy Practicum 1**

Instructs in the writing of general menus and in the therapeutic modification of general diets. Students attend patient care conferences and write the dietary section of patient care plans.

**3615 Sanitation 2**

Deals with sanitation and OSHA regulations as they apply to a dietary department.

**3616 Sanitation Practicum 1**

Includes evaluation of sanitation in dietary departments, study of OSHA regulations, and writing of recommendations for improvement.

**3617 Cost Control 2**

Discusses purchasing and cost control as applied to a dietary department. Introduces food specifications, factors affecting the food market, labeling of food, convenience foods, and inventories.

**3618 Cost Control Practicum 1**

Teaches student how to determine costs of food, non-food supplies, and labor and how to evaluate labels before ordering.

**3619 Food Preparation 2**

Presents and practices food preparation techniques. Includes standardized recipes, the metric system, and types of tray service.

**3712 Medical Office Procedures Clinical I 4-6**

Teaches student to prepare patients for routine examinations in a physician's



office. Demonstrates how to assist with physical examinations, take and record vital signs, maintain and prepare sterile equipment, and order supplies. Also provides understanding of the principles of nutrition.

### **3713 Medical Office Bookkeeping 4**

Introduces principles of bookkeeping, with emphasis on the needs of the medical office. Includes debit and credit, double entry bookkeeping, use of journals (particularly combined cost journals), and transaction analysis.

### **3719 Medical Typewriting—Prerequisite: 1212 3**

Focuses on typewriting skills for the medical field, with emphasis on articles, medical forms, case histories, and correspondence. Includes use of medical terminology.

### **3721 Medical Office Procedures - Administrative 4**

Covers secretarial, receptionist, housekeeping, and managerial duties and responsibilities pertaining to medical offices and health care agencies. Includes records management; handling of mail; scheduling and telephoning; inventory procedures; financial administration; contact procedures with vendors, patients, hospitals, and professional agencies; and responsibilities in the physician's absence.

### **3722 Medical Typewriting I—Prerequisite: 45 nwam 3**

Develops skills in production typing of letters, forms, manuscripts, and tabulations. Emphasis placed on building speed in typing medical letters and case histories utilizing medical terms.

### **3726 Medical Typewriting II 4**

Continues Medical Typewriting I (3725), with emphasis on speed and accuracy.

### **3728 Medical Assistant Clinical Externship I 6**

Offers opportunity to perform various administrative procedures under supervision. Students will work in selected physicians' offices, clinics and hospitals 20 hours per week for 11 weeks.

### **3729-3769 Medical Assistant Clinical/Administrative Externship 4**

Offers opportunities to perform clinical and administrative procedures under supervision in selected physicians' offices, clinics, and hospitals. Includes weekly seminars for discussion of students' learning experiences and situations.

### **3730 Medical Assistant Laboratory Techniques 4**

Instructs students in the performance of lab procedures, including the preparation of patients and the collection and preparation of specimens. Familiarizes the student with test purposes, results, and norms.

### **3731 Medical Assistant Clinical Experience I—Prerequisites: 3712, 3741 4-5**

Provides opportunity to perform various administrative procedures under supervision in selected physicians' offices, clinics and hospitals.

**3732 Medical Office Communications****4**

Develops the communications skills required in the medical office. Emphasis on human relations.

**3733 Medical Typewriting II—Prerequisites: 3722, 9355****2-3**

Continuation of Medical Typewriting I (3722), with emphasis on speed and accuracy.

**3734 Medical Laboratory Techniques I****2**

Introduces laboratory and X-ray procedures, with emphasis on preparation of patient. Explains purposes and expected norms of results. Develops skills in the collection, preparation, preservation, and delivery of specimens, including urine, blood, biopsies, Pap smears, and cultures.

**3735 Medical Laboratory Techniques II—Prerequisites: 3730, 3731****3**

Continuation of 3730 and 3731. Demonstrates tests performed in a physician's office, such as urinalysis, gram stains, pregnancy tests, blood counts, and sedimentation rates. Outlines the safety hazards associated with the handling of X-ray equipment, the precautionary measures to be taken, and the preparation of patients for X-rays.

**3738 Written Communications****2**

Presents fundamentals of writing, with emphasis on correspondence skills and medical history procedures.

**3740 Medical Linguistics II****2**

Continuation of Medical Terminology (9355), with emphasis on Greek and Latin components and their spellings. Studies terms associated with the urinary, endocrine, reproductive, respiratory, nervous, and sensory systems; anatomy; diseases; anomalies; and surgeries.

**3742 Medical Office Procedures Clinical II****6**

A continuation of Medical Office Procedures Clinical I (3721).

**3743 Machine Transcription Medical I****3**

Presents fundamentals of medical dictation and machine transcription. Includes typing of medical reports, study of medical terms, and practice in medical correspondence.

**3744 Machine Transcription Medical II—Prerequisites: 3743****3**

Presents advanced medical dictation and machine transcription. Students are expected to demonstrate proficiency in medical terminology and typing of medical materials.

**3751 Machine Transcription Medical II****3**

A continuation of Machine Transcription Medical I (3743), with emphasis on case studies and reports.

- 3752 Medical Office Procedures Clinical III—Prerequisites: 3712, 3742** **6**  
Emphasizes principles and procedures pertaining to office practice. Includes diagnostic procedures, mathematics for office practice and pharmacology, and care of stock medications, drug samples, and instruments. Gives instruction also in therapeutic diets.
- 3753 Drugs and Solutions** **2**  
Introduces hygiene students to the fundamentals of pharmaceutical preparations used in the medical office. Covers chemical properties, dosages, methods of administration, and therapeutic uses.
- 3761 Community Health** **2**  
Studies health service in the community. Discusses preventive services, the institutional components of health care systems, and the financing of health care and manpower. Explores issues of quality environment, such as pollution and population control, and of public policy regarding research planning and health problems.
- 3763 Medical Office Management** **3**  
Trains the student in the organization and management of a physician's office. Provides in-depth study of government health insurance coverage.
- 3766 First Aid** **3**  
Trains the student to recognize emergency situations, take the proper course of action, and apply appropriate first aid.
- 3768 Comprehensive Certification Review** **3**  
Prepares for the certification test.
- 3769 Medical Assistant Administrative Externship** **4**  
Provides supervised experience for students in the performance of various administrative procedures.
- 3770 Externship Seminar** **2**  
Discusses and evaluates student experiences in the externship offices. Also includes lectures and demonstrations by the instructor and guest speakers on subjects pertinent to working in the medical office.
- 3771 Medical Insurance** **3**  
Provides an overview of medical insurance programs. Develops skills in handling medical insurance forms and reports.
- 4005 Motivation and Learning** **4**  
Students will be able to understand, describe, and apply theories of motivation and learning to situations involving human interactions, particularly with regard to para-professionals employed in a human service setting.

**4010 Human Services I****4**

Covers the history, philosophy, and development of human services and identifies and analyzes the primary services available in urban and rural America. Acquaints the student with the major human service agencies and institutions in the local area. Emphasizes paraprofessional careers available in various types of human service work.

**4020 Human Services II****4**

Studies the major client groups with which the paraprofessional works. Includes analysis of individual and situational problems, methods of client-training and assistance, and field visits to agencies.

**4021 Adolescent Development****4**

Studies the physical, social, emotional, and mental development of adolescents. Considers cultural influences and individual differences in the development of adolescents.

**4022 Drugs and Alcohol****4**

An introductory course dealing with problem drinking and drug abuse. Includes theories of alcoholism, identification of signs and symptoms, and information on treatment sources.

**4023 Problems of Alcohol and Drug Addiction****4**

Offers an approach to the assessment and treatment of alcohol and drug addiction, with emphasis on treatment. Attention given also to theories of alcoholism and drug abuse as disease.

**4024 The Physiological Effects of Alcohol and Drugs****4**

Studies the effects of alcohol and other drugs on the body.

**4025 Group Leadership and Group Process****4**

Introduces the dynamics of group interaction and leadership. Examines problems of communications, effective emotional responses, and personal growth. Emphasizes direction of the group process as a method of changing behavior.

**4026 Family Counseling Approaches to Alcohol Problems/Drug Abuse****4**

Studies the dynamics of the alcoholic family and explores practice strategies for the worker who counsels the family.

**4027 Intervention and Referral Techniques****4**

Studies techniques used for beginning and crisis counseling, intake interviewing, and referral. Special attention is given to the process of intervention and to the admission and recording of information concerning alcohol and drug abuse clients.

**4030 Human Services III****4**

Studies interpersonal relationships, including the development of social behavior and self-awareness through communication. Examines humanistic and behavioristic

aspects of paraprofessional relationships, and methods and techniques of paraprofessional interviewing and counseling.

#### **4031 Introduction to Social Welfare 4**

Introduces the philosophy of social service and provides analysis of the client-worker relationship within the agency setting. Provides an overview of job opportunities in social service.

#### **4032 Helping Relationship Techniques 4**

Develops skills in client-worker relationships. Also teaches the student what to do before, during, and after an interview or counseling session.

#### **4033 Helping and Behavioral Stress 4**

Provides instruction in the techniques of adjustment to stress or change.

#### **4034 Interviewing and Counseling 4**

Develops skills in client-worker relationships through practice.

#### **4040 Basic Health Sciences 4**

Introduces principles of science as they relate to health. Includes study of the structure and function of the human body, principles of food and nutrition, and selected aspects of microbiology.

#### **4041 Directed Practice I 6**

Offers students supervised participation in appropriate agencies.

#### **4042 Introduction to Activity Therapy 4**

Introduces activity therapy through visits to local facilities offering activity programs for special population groups. Emphasis on community and special agency activity therapy programs.

#### **4043 Activity Therapy with Special Populations 4**

Surveys craft media and activities. Plans, organizes, selects materials and supplies and leads craft projects. Emphasis placed on adapting activities to the special needs of various client groups.

#### **4044 Institutional Activity Therapy 4**

Emphasizes activity therapy methods, techniques, and program development within medical hospitals and specialized live-in institutions. Also provides an insight into the interdisciplinary approach to rehabilitation.

#### **4045 Activity Therapy Program Planning 4**

Introduces the characteristics and activity needs of the handicapped, disadvantaged, ill, and aged. Also presents basic program planning and leadership roles. Exposes students to different special groups and settings (i.e., hospital, institutional, nursing home, community center).

**4050 Group Process and Skills****4**

Introduces group theory and process and explores the effect of groups on society. Examines the membership and leadership of different kinds of groups, with focus on the group process. Considers the need for social change with regard to personal and social values and gives attention to the goals and strategies of social change.

**4051 Directed Practice II****6**

Offers the student an opportunity to apply acquired values, concepts, and skills in actual work experiences at an agency.

**4052 Psychology of Aging and Death****4**

Studies the developmental processes of adulthood, with special emphasis on aging and death.

**4053 Physiology of Aging****4**

Studies the changing physiological functions of the human body in response to aging. Also examines the interrelationships of the body's systems.

**4054 Recreational Programming for the Elderly****4**

Teaches the student how to design and implement programs of recreational activities suited to the needs of the elderly.

**4055 Nursing Home Administration****4**

Prepares students to assist in nursing home administration. Covers departmental bookkeeping, record keeping, budget preparation, ordering and storing supplies, medications, preparation of in-service programs, public relations, personnel policies, payroll, and personnel evaluation procedures.

**4056 Activity Therapy with Physically Disabled****4**

Acquaints the student with the characteristics and activity needs of the physically disabled.

**4060 Program Planning and Evaluation****4**

Covers the planning and evaluation of human service programs. Deals specifically with problems involved in the transformation of policy goals into human service delivery systems, such as program funding, cash management, human resources, accountability, and community relations.

**4061 Directed Practice III****6**

Continuation of Directed Practice II (4051).

**4062 Introduction to Community Organization and Development****4**

Presents methods of organizing community groups for action in the fields of health, welfare, housing, consumerism, and environment. The student is responsible for the planning of one program initiating action in a specific problem area.

- 4063 Coordination of Volunteers** 4  
Focuses on recruitment, training, supervision and evaluation of volunteer workers with, emphasis on winning commitment and cooperation.
- 4065 Human Services Topical Seminar** 4  
Discusses current issues of concern to workers in the human services field. Topics selected according to students' interests.
- 4201 Introduction to Surgical Concepts** 2  
Introduces selected basic nursing procedures and the required performance skills. Relates aseptic concepts and techniques to the special needs of the operating room. Covers pre- and postoperative care of the patient.
- 4211 Surgical Techniques I** 10  
Applies the principles of sterile technique to the pre-operative, operative, and postoperative care of the patient. Includes orientation to an ideal situation, patient positioning and transportation, concepts of anesthesiology, techniques in handling drapes, care of contaminated cases, knowledge of explosion hazards, prevention of infections, processing and preparation of nondisposable items, sterilization, instrument identification, suture and needle use, care of surgical specimens, record keeping, surgical preps, and hand scrubbing, gowning, and gloving procedures.
- 4221 Surgical Procedures I** 5  
Studies basic surgical procedures in relation to the total physiological aspects of surgical interaction, including a concept of the involved anatomy, existing pathology, surgical hazards encountered, a review of the total patient, diagnostic tests, and immediate postoperative care.
- 4222 Clinical Applications I** 8  
Applies principles and concepts learned in the classroom to clinical situations.
- 4223 Operating Room Techniques II** 3  
Offers experience in the application of all phases of aseptic technique. Demonstrates step-by-step procedures for typical general surgery operations.
- 4230 Surgical Procedures II** 5  
Studies advanced and specialized surgical procedures in relation to the total physiological aspects of surgical interaction. Focuses on the concept of the involved anatomy, existing pathology, surgical hazards encountered, surgical procedures, and review of total patient cases.
- 4231 Clinical Applications II** 10  
Continues Clinical Applications I (4222)
- 4232 Obstetrical Techniques** 3  
Examines the effect of pregnancy anatomically, physiologically, and psychologi-

cally on the obstetric patient. Provides opportunities for operating room technician students to function in the obstetrical unit and in the operating room.

#### **4240 Clinical Applications III**

10

Continues Clinical Applications II (4231)

#### **4241 Emergency Room Techniques**

2

Examines the psychological and physiological effects of trauma on the emergency patient. Provides knowledge of emergency conditions and procedures and the human capacity to function under adverse conditions.

#### **4242 Surgical Procedures III**

4

Studies specialized procedures in neurosurgery, cardiovascular surgery and chest surgery; stresses pertinent anatomy and pathology, diagnostic tests, and immediate postoperative care.

#### **4244 Operating Room Medical Terminology**

2

Reviews medical terminology pertinent to the operating room as it relates to the administration of therapeutic agents and the initiation of therapeutic action.

#### **4245 Clinical Orientation**

1

Introduces the student to the job skills needed by the surgical technologist through observation of surgical procedures in the clinicals associated with the program.

#### **4401 Foundations of Nursing**

3

Introduces the principles of nursing, the hospital environment, patient safety, personal hygiene, and principles and applications of body mechanics. Also discusses the role of nursing hospitalized patients.

#### **4402 Collecting, Reporting, and Recording Patient Data**

3

Includes principles of communications, assisting with physical examinations, measuring vital signs, and reporting and recording pertinent information in correct medical terms.

#### **4403 Therapeutic Measures**

3

Addresses the regulation of food and fluid intake and elimination and demonstrates how to perform simple analysis of specimens. Includes the writing of nursing care plans in non-complex situations, the principles of medical and surgical asepsis, pre- and postoperative care, and the administration of therapeutic agents.

#### **4406 Holistic Approach to Health**

3

Reviews theories concerning the relatedness of body, mind, and spirit. Examines the interrelated roles of the clergy, nursing, and other health disciplines in health care.



**4407 Nutrition****2**

Introduces principles of nutrition and diet therapy diets for various age groups. Gives attention to socioeconomic, ethnic, and religious food preferences.

**4408 Oncologic Nursing****1**

Includes classification of neoplastic disorders, etiology, diagnostic procedures, current modes of therapy, and nursing intervention.

**4412 Endocrine Nursing****2**

Includes study of deviations from normal function described by diagnostic testing, symptomatology, and corresponding nursing action; group planning of holistic nursing care; information concerning supportive community agencies; nursing responsibilities for medical orders, drugs, and diet therapy; discussion of nursing action for rehabilitation and psychological adjustment; and modes for teaching the patient responsibility for healthful living. Both medical and surgical aspects of common generic disorders are discussed, as well as preventive and first aid measures.

**4415 Cardiovascular Nursing****3**

Includes study of deviations from normal function described by diagnostic testing, symptomatology, and corresponding nursing action; group planning of holistic nursing care; information concerning supportive community agencies; nursing responsibilities for medical orders, drugs, and diet therapy; discussion of nursing action for rehabilitation and psychological adjustment; and modes for teaching the patient responsibility for healthful living. Both medical and surgical aspects of common generic disorders are discussed, as well as preventive and first aid measures.

**4416 Gastrointestinal Nursing****3**

Includes study of deviations from normal function described by diagnostic testing; symptomatology, and corresponding nursing action; group planning of holistic nursing care; information concerning supportive community agencies; nursing responsibilities for medical orders, drugs, and diet therapy; discussion of nursing action for rehabilitation and psychological adjustment; and modes for teaching the patient responsibility for healthful living. Both medical and surgical aspects of common generic disorders are discussed, as well as preventive and first aid measures.

**4419 Respiratory Nursing****2**

Includes study of deviations from normal function described by diagnostic testing, symptomatology, and corresponding nursing action; group planning of holistic nursing care; information concerning supportive community agencies; nursing responsibilities for medical orders, drugs, and diet therapy; discussion of nursing action for rehabilitation and psychological adjustment; and modes for teaching the patient responsibility for healthful living. Both medical and surgical aspects of common generic disorders are discussed, as well as preventive and first aid measures.

**4421 Medical Surgical Nursing I—Prerequisites: 4409, 4410, 4411, 4420, 4430, 4443, 4450—Corequisite: 4423****4**

Studies nursing care of adults, including etiology, pathophysiology, symptoms, diagnostic tests, and nursing measures for specific disease conditions. Also includes preventive measures as well as management of disease through use of therapeutic

agents. Discusses pre- and postoperative care of surgical patients and diabetics and conditions related to the cardiovascular system.

**4422 Nutrition and Diet Therapy—Prerequisites: 4409, 4410, 4411, 4420, 4430, 4443, 4450** **2**

Introduces basic principles of nutrition and diet therapy, including dietary allowances for various age groups, and socioeconomic, ethnic, and religious food preferences.

**4423 Medical Surgical Clinical Nursing I—Prerequisites: 4409, 4410, 4411, 4420, 4430, 4443, 4450—Corequisite: 4421** **3**

Provides clinical experience, with emphasis on the nursing process. Offers opportunity to implement nursing skills as correlated with medical-surgical theory pertaining to the care of the adult patient.

**4425 Musculoskeletal and Neurological Nursing** **2**

Includes study of deviations from normal function described by diagnostic testing, symptomatology, and corresponding nursing action; group planning of holistic nursing care; information concerning supportive community agencies; nursing responsibilities for medical orders, drugs, and diet therapy; discussion of nursing action for rehabilitation and psychological adjustment; and modes for teaching the patient responsibility for healthful living. Both medical and surgical aspects of common generic disorders are discussed, as well as preventive and first aid measures.

**4426 Genitourinary Nursing** **2**

Includes study of deviations from normal function described by diagnostic testing, symptomatology, and corresponding nursing action; group planning of holistic nursing care; information concerning supportive community agencies; nursing responsibilities for medical orders, drugs, and diet therapy; discussion of nursing action for rehabilitation and psychological adjustment; and modes for teaching the patient responsibility for healthful living. Both medical and surgical aspects of common generic disorders are discussed, as well as preventive and first aid measures.

**4432 Medical Surgical Clinical Nursing II—Prerequisites: 4409, 4410, 4411, 4420, 4423, 4430, 4443, 4450—Corequisite: 4431** **3**

Provides students opportunities to implement nursing skills as correlated to medical-surgical theory in the care of the adult patient. Emphasis placed on nursing process and drug administration.

**4434 Intravenous Therapy** **2**

Covers concepts of fluid, electrolyte and acid base balance as applied to total parenteral nutrition and therapy.

**4437 Dermatologic and EENT Nursing** **2**

Includes study of deviations from normal function described by diagnostic testing, symptomatology, and corresponding nursing action; group planning of holistic nursing care; information concerning supportive community agencies; nursing responsibilities for medical orders, drugs, and diet therapy; discussion of nursing action for rehabilitation and psychological adjustment; and modes for teaching the patient responsibility

for healthful living. Both medical and surgical aspects of common generic disorders are discussed, as well as preventive and first aid measures.

#### **4438 Gerontology** **2**

Studies the processes of normal aging, with emphasis on the increasing psychological, emotional, recreational, and activity needs of the elderly.

#### **4439 Geriatric Clinical Nursing** **3**

Introduces geriatric care outside the hospital environment, nursing care, activities, and recreation for the older adult.

#### **4440 Maternal Health Nursing** **3**

Provides information designed to serve the needs of mother and infant. Studies the maternity cycle, the growth and development of newborns, and appropriate nursing intervention.

#### **4441 Personal Vocational Relationships** **2**

Correlates with specific activities of students; deals with human behavior; hospital organization, legalities of nursing, nursing organizations, and employment for the licensed practical nurse (LPN).

#### **4442 Maternal Clinical Nursing—Prerequisites: 4409, 4410, 4411, 4420 4421, 4422, 4423, 4430, 4431, 4432, 4443, 4444, 4445, 4446, 4460, 4451, 4452—Corequisite: 4440** **4**

Provides maternal nursing experience, including care for mothers in labor, delivery, and on the postpartal unit, as well as care for the newborn. Emphasis is placed on the nursing process.

#### **4443 Nursing Techniques and Care IV—Prerequisite: 4430** **3**

Introduces students to techniques used in the administration of therapeutic agents. Discusses the role of the LPN and RN in relation to the administration of therapeutic agents and the initiation of therapeutic action.

#### **4448 Multiple Patient Clinical Experience** **3**

Demonstrates how to care for several patients, how to serve as medicine and treatment nurse, and how to plan and evaluate the nursing care given by nursing assistants.

#### **4449 Practical Nurse in Today's Society** **2**

Includes history of nursing, nursing organizations, continuing education, legal aspects of nursing, licensure, employment, and moral and ethical issues raised by modern technology.

#### **4451 Medical Surgical Nursing IV—Prerequisites: 4409, 4410, 4411, 4420, 4421, 4423, 4430, 4431, 4432, 4443, 4444, 4445, 4450—Corequisite: 4452** **3**

Studies nursing care of adults, including etiology, pathophysiology, symptoms, diagnostic test and nursing measures for specific disease conditions; emphasizes measures to prevent illness, management of disease through use of therapeutic

agents; discusses conditions related to neurological, integumentary, vision, and hearing functions.

**4452 Medical Surgical Clinical Nursing IV—Prerequisites: 4409, 4410, 4411, 4420, 4421 4422, 4423, 4430, 4431, 4432, 4443, 4444, 4445, 4450—Corequisite: 4451 3**

Provides medical-surgical clinical experience, including implementation of community resources in discharge planning; emphasizes care of patients with neurological, integumentary, vision, and hearing impairments.

**4453 Pediatric Nursing 3**

Addresses growth and development from infancy through adolescence, congenital anomalies, and pathophysiology, with appropriate nursing intervention.

**4454 Pediatric Clinical Nursing 2**

Provides students the opportunity to implement nursing skills in the care of the pediatric patient. Emphasis placed on human growth and development and the nursing process.

**4456 Maternal Clinical Nursing 4**

Provides an opportunity to care for mothers in labor, delivery, and on the postpartal unit as well as caring for the newborn. Includes the administration of drugs on postpartal units.

**4457 Medical-Surgical Clinical Nursing VI 3**

Provides an opportunity to implement didactic knowledge. Correlates medical-surgical theory with clinical experience.

**4458 Communication Techniques For Health Maintenance 2**

Stresses the importance of health education for both the patient and family. Discusses techniques used to provide health information.

**4501 Nursing Assessment and Process 3**

Studies include techniques of data collection, assessment of the patient, planning of nursing care, and nursing intervention.

**4502 Life Cycle Nursing 5**

Examines and discusses patient needs as problems inherent at different stages of life and adjustment.

**4503 Life Cycle Nursing Practicum 3**

Focuses on the application of nursing principles to assist with adjustments throughout the life cycle.

**4504 Advanced Medical-Surgical Nursing 8**

Offers intensive study of the pathophysiology of the various medical/surgical conditions. Emphasis placed on use of the nursing process to assist the patient in recover-

ing or in learning to live within the limitations of the condition. Also examines patient teaching and discharge planning.

#### **4505 Medical-Surgical Nursing Practicum 5**

Offers clinical experience in patient assessment and implementation of the nursing process.

#### **4506 Psychiatric Nursing—Prerequisite: Previous or concurrent course in normal psychology. 4**

Covers symptomatology and treatment modalities for common mental illnesses. Attention given to the RN's role in early detection, intervention at the crisis stage, and communication skills necessary for interacting with psychiatric patients.

#### **4507 Psychiatric Nursing Practicum 5**

Offers opportunity to implement didactic knowledge and experience in providing and caring for the hospitalized patient in crisis and for the patient requiring long-term treatment.

#### **4508 Leadership 3**

Introduces the dynamics of group interaction and group leadership. Special attention given to problems of communication, effective emotional responses, and personal growth.

#### **4509 Transition and Issues in Nursing 3**

Explores the transition from the role of LPN to RN. Emphasis placed on history, trends, and the legal and ethical aspects of nursing.

#### **4510 LPN Clinical Assessment Transition 3**

Offers clinical experience for LPNs to validate nursing skills.

#### **4609 Nursing Procedures for X-Ray Technicians 2**

Presents basic nursing care as provided by the radiologic technologist. Covers patient-technician relationships, principles of asepsis, isolation, and first aid.

#### **4613 Radiation Physics I 3**

Introduces physics as utilized in the production of X-rays. Includes laws of physics pertaining to atomic structure, chemical properties and reactions, and electrical circuitry. Also studies equipment and methods of generation and measurement of electricity.

#### **4620 Orientation to X-Ray Technology 4**

Discusses the historical development of X-ray technology and the role and function of the radiologic technologist. Studies principles of the X-ray tube, properties of radiation, film-processing equipment, intensifying screens, terminology, and introductory techniques of positioning the chest and abdomen. Stresses procedures and practices of radiation protection.

**4622 Radiation Physics II****3**

Correlates laws and principles of physics and radiation circuitry, X-ray production, measuring devices and units, and photoelectric effect. Studies use of X-ray and monitoring equipment.

**4623 X-Ray Clinical Education I****5**

Implements Clinical Category I of the Competency Model. Includes laboratory demonstration and clinical practice.

**4624 Radiographic Positioning I****3**

Correlates positioning terminology and techniques and film evaluation with Clinical Category I. Demonstrates upper extremity, intravenous pyelogram, and gall-bladder examinations.

**4625 Principles of Radiographic Exposures I****3**

Presents film construction, sensitometry and processing techniques. Emphasizes the definition and effect of prime radiography factors related to the formulation of exposures.

**4633 Radiographic Positioning II****2**

Correlates positioning terminology and techniques and film evaluation to Clinical Category 2. Includes study of lower extremity, upper GI, esophagus, small bowel, and cardiac fluoroscopy.

**4634 Principles of Radiographic Exposures II****3**

Demonstrates, through a series of problem-solving exercises, conversion factors affecting the elements of radiographic quality. Includes pediatric techniques, calibration, heat unit determination, and technique chart construction.

**4638 X-Ray Clinical Education II****6**

Emphasizes Category 2 of the Competency Model laboratory testing while competency skills over Category I are tested. Includes supervised clinical experience.

**4642 Imaging Techniques****3**

Presents theories, principles and demonstrations of current image modalities, including the image intensifier, tomography, video and cine camera, serial changers, subtraction technique, polaroid, thermography, ultra sound, and xeradiography.

**4643 Radiographic Positioning III****3**

Correlates positioning terminology, techniques, and film evaluation to Clinical Category 3. Includes the vertebral column, bony thorax, colon, cystogram, and IV cholangiogram examinations.

**4648 X-Ray Clinical Education III****6**

Introduces Category 3 of the Competency Model laboratory testing while competency skills over Category 2 are tested. Implements a skill maintenance program and continues clinical application.

- 4650 Radiographic Positioning IV** **3**  
Presents positioning terminology, techniques, and film evaluation of Clinical Category 4. Covers the cranium, special skull examinations, and mammography.
- 4655 X-Ray Clinical Education IV** **6**  
Introduces Category 4 of the Competency Model in laboratory testing while competency skills over Category 3 are tested. Skill maintenance over previous categories continues during clinical applications.
- 4661 Special Procedures** **3**  
Presents selected studies of the vascular, neurological, reproductive, and other systems and demonstrates the related equipment and techniques of positioning.
- 4668 X-Ray Clinical Education V** **6**  
Completes Category 4 of the Competency Model in laboratory testing. Continues skill development in all previous categories and clinical applications.
- 4672 Radiobiology** **3**  
Presents theory and principles of the effects of ionization radiation upon living tissues. Includes a review of dosage measurements, DNA structure and function, and cellular radiosensitivity.
- 4678 X-Ray Clinical Education VI** **6**  
Completes all category testing. Continues skill development in all categories.
- 4685 General Examination Review** **4**  
Reviews contents of program, emphasizing anatomy, physics, exposure principles and positioning. Simulated American Registry tests prepare the student for the certification examination.
- 4688 X-Ray Clinical Education VII** **6**  
Includes final competency testing for students who have not completed X-Ray Clinical Education VI (4678). Continues maintenance over all categories.
- 4697 Seminar for Radiologic Technicians** **1**  
Topics may include student reports from professional journals, discussion of continuing education in the profession, update of CPR skills, and problems of equipment maintenance.
- 4698 X-Ray Registry Review For Noncertified Personnel** **2**  
Helps noncertified radiologic personnel to prepare for the American Registry examination and to meet the requirements outlined in the Indiana Senate Act 191. Includes lecture, reading assignments, and individualized study.
- 4699 Radiographic Quality Assurance** **3**  
Presents theories and practices pertaining to the establishment of department exposure standards. Coverage includes equipment tests for reliability, problem-solving,

reject analysis, and cost containment. Offers hands-on experience in processor monitoring, record-keeping, and radiographic quality control tests.

#### **4710 Nurse Aide Nursing Skills**

**5**

Provides classroom instruction and supervised laboratory practice in basic nursing skills.

#### **4711 Introduction For Nurse Aide To Medical Surgical Problems**

**2**

Introduces body functions and pathology. Emphasizes the role of the nursing assistant in the care of patients with abnormal body functions.

#### **4712 Clinical Experience For Nurse Aide**

**2**

Provides opportunities to implement nursing skills and concepts taught in the classroom.

#### **4715 Home Health Care Practicum**

**1**

Offers extended practice in home health care.

#### **4810 Basic Science**

**4**

Studies the fundamentals of chemistry, physics, and mathematics as related to respiratory therapy. Introduces English and metric measuring and symbol systems; stresses general gas laws related to gas transport.

#### **4812 Respiratory Therapy Science I**

**6**

Presents a brief history of respiratory therapy, the principles and practices of oxygen administration, humidity and aerosol therapy, and gas analyzers. Emphasis is placed on safety.

#### **4813 Nursing Techniques**

**2-3**

Includes patient needs, asepsis, body mechanics, CPR, vital signs, isolation techniques, medical terminology, and charting.

#### **4820 Cardiopulmonary Physiology—Prerequisite: 4812**

**4**

Studies the cardiopulmonary system. Includes ventilation, perfusion, gas exchange, blood gases and acid base studies, and physiologic monitoring. Emphasis placed on airway management.

#### **4821 Respiratory Therapy Science II—Prerequisite: 4812**

**6**

Studies the mechanics of ventilation, IPPB, principles and uses of mechanical respirators, airway management, incentive spirometry, chest physiotherapy, and pulmonary rehabilitation.

#### **4822 Respiratory Therapy Applications I—Prerequisite: 4812**

**5**

Studies applications of respiratory therapy through direct observation in various clinical areas.



<b>4823 Clinical Practicum I—Prerequisite: 4812</b>	<b>6</b>
Provides supervised experience in oxygen therapy, CPR, and various respiratory therapy tasks in clinical areas.	
<b>4830 Laboratory Data—Prerequisite: 4812—Corequisites: 4820, 4821, 4831</b>	<b>3</b>
Studies techniques for sputum collection, lung function testing, and blood gas analysis.	
<b>4831 Clinical Medicine</b>	<b>4</b>
Introduces etiology, symptomatology, diagnosis, therapeutics, and prognosis of disease conditions related to respiratory therapy.	
<b>4832 Respiratory Therapy Applications II</b>	<b>5</b>
Continues Clinical Practicum I (4823).	
<b>4833 Clinical Practicum II—Prerequisite: 4823</b>	<b>8</b>
Continues Clinical Practicum I (4823). Provides clinical experience in IPPB, incentive spirometry, chest physical therapy, airway maintenance, and pulmonary functions.	
<b>4835 Respiratory Therapy Science III—Prerequisite: 4821</b>	<b>6</b>
Introduces practices of the critical respiratory care of adults and infants. Studies volume and pediatric ventilators and the care of patients receiving mechanical ventilation.	
<b>4837 Pulmonary Pathophysiology—Prerequisite: 9354</b>	<b>4</b>
Introduces etiology, symptomatology, diagnosis, therapeutics, and prognosis of disease conditions related to respiratory therapy.	
<b>4841 Clinical Practicum III—Prerequisite: 4833</b>	<b>13</b>
Continues Clinical Practicum II (4833).	
<b>4844 Cardiopulmonary Laboratory Diagnosis—Prerequisite: 4837</b>	<b>4</b>
Introduces the function of the cardiopulmonary laboratory and provides an understanding of basic pulmonary function tests and techniques. Includes blood gas interpretation, electrolytes, sputum collection and study, electrocardiography, and basic cardiac arrhythmias.	
<b>4845 Seminar—Corequisite: 4841</b>	<b>2</b>
Includes preparation and presentation to faculty and peers of in-depth case studies and reports drawn from current literature.	
<b>4846 Comprehensive Certification Review</b>	<b>4</b>
Covers the thirteen major units recommended for study by the National Board of Respiratory Therapy. Classwork is designed to increase confidence and to prepare the student for examination.	

**4847 Comprehensive Certification Review****5**

NOTE: Same as course (4848). New number issued to permit students to enroll in the course for the greater number of credits. The student will enroll either in course 4846 or 4847 - not in both.

**4848 Advanced Cardiopulmonary-renal Physiology****6**

Studies the physiology and interrelations of the cardiac, respiratory, and renal systems, with emphasis on advanced analysis, evaluative techniques, and correlation with pathophysiology.

**4849 Management Techniques for Respiratory Therapy****3**

Studies management problems unique to the Respiratory Therapist. Develops proficiency in laboratory techniques designed to alleviate common problems. Emphasis on supervisory techniques, personal management and budgeting.

**4850 Therapist Clinic I****7**

Develops proficiency in entrance level clinical skills under supervision at clinical facilities. Includes basic modalities of respiratory therapy and diagnostic and ventilator techniques. (4841 may be substituted for this course)

**4851 Therapist Clinic II****12**

Provides the student with supervised advanced clinical experience in respiratory therapy. Includes various specialty rotations.

**4852 Critical Respiratory Care****6**

Develops proficiency in critical care therapeutic modalities as they apply to neonatal, pediatric, and adult respiratory patients. Special emphasis on evaluation, monitoring, transportation, and management of patients on mechanical ventilation.

**TRADE AND TECHNICAL****5113 Principles of Internal Combustion Engines****2**

Studies fundamentals of internal combustion engines, including 2- and 4-cycle engine theory, magnets, battery and thermal ignition, carburetors, fuel pumps, cooling and lubrication systems, preventive maintenance, and safety.

**5114 Direct Current Fundamentals****2**

Deals with the electrical functions of all three fueled engines as they pertain to starting, storage, charging, lighting, and ignition components. Attention given also to controlling and protective devices and to safety precautions.

**5115 Hydraulic Fundamentals****2**

Studies the physical properties and control of fluids; the components of valves, pumps, cylinders, conduction, accumulators, and cylinders; and multiplication of forces.

- 5116 Tractor Engines 3**  
Studies the components and purposes of the flywheel, crankshaft, cam shaft, connecting rod, piston, head-cylinder block, sleeves, water pump, oil lubrication pump, carburetor, fuel pump, distributor drive, governor, and radiator. Compares laboratory diesel and gasoline engines.
- 5123 Diesel Engines I 3**  
Deals with intake and exhaust systems of agricultural and industrial diesels, including fuel delivery systems, theory of thermal ignition, fuel, air and lubrication filtration, and the preventive maintenance required for each component. Also compares laboratory diesel engines with gasoline and L-P engines.
- 5124 Manual Transmissions 3**  
Studies sliding gear transmissions and related components of the power train, including clutches, differentials, final drives and power take-off mechanisms. Also studies manual steering and brakes and collar shift and synchromesh transmissions.
- 5125 Open Center Hydraulic Systems 3**  
Studies hydraulic systems used on older tractors and smaller tractors and machinery, including gear and vane type pumps, spool and rotary valves, flow dividers, relief valves, single- and double-action cylinders, simple low horsepower hydraulic motors, preventive maintenance, and safety.
- 5126 Closed Center Hydraulic Systems 3**  
Studies radial and axial piston type pumps; accumulators; stroke control valves; closed center rotary and spool valves; and direction, pressure, and volume control valves; with emphasis on preventive maintenance.
- 5127 Hydraulic Assist Transmissions 3**  
Studies hydraulic components of the main hydraulic supporting systems. Includes hydraulic assist steering, brakes, clutches, differential locks, power takeoff mechanisms and hydraulic assist transmissions, with emphasis on preventative maintenance.
- 5128 Electronic Controlled Transmission 3**  
Studies the combination of a heavy duty 6-speed planetary powershift transmission with a 2.30:1 multiplication ratio torque converter. Shifting is done by a microprocessor.
- 5132 Diesel Engines II 3**  
Studies diesel pumps and injectors, their timing, and permissible service during tune-up. Studies laboratory pumps and nozzles with regard to function and purpose.
- 5133 Environmental Control 4**  
Studies the control of natural resources, the current status of resource preservation, and agricultural responsibility with regard to soil, water and air pollution.

**5134 Parts Department Management****3**

Studies the operation of a parts department in accordance with widely accepted management procedures. Covers inventory control and turnover, profit margins, public relations, and diagnosis of fill rate. Attention given to emergency orders and the management of obsolete parts.

**5135 Diesel Engines II****2**

Includes dynamometer loading of a diesel engine to study thermal efficiency with and without turbocharger; study of engines fitted with intake and exhaust manifold vacuum-pressure gauges, pyrometer, tachometer, and manometer; tune-up; and use of dynamometer to meet the original equipment manufacturer's specifications. Emphasis on preventive maintenance.

**5137 Service Department Management****3**

Deals with the management and operating procedures of a service department as practiced by successful automotive dealers. Includes recovered labor costs, incentive programs, shop flow schedules, flat rates, shop tickets, merchandising, and customer relations.

**5142 Lawn and Garden Equipment****3**

Studies equipment powered by internal combustion engines of less than 35 horsepower. Includes plows, disks, harrows, rakes, tillers, seeders, fertilizer spreaders, sprayers, standby alternators, irrigation pumps, and mowing equipment. Emphasis on preventive maintenance and safety.

**5144 Crawler Undercarriages****2**

Studies service requirements for the 13 main components of a crawler undercarriage, including servicing of flush and counterbored track links and the track master link. Also studies the diagnosis of undercarriage and track alignment. Emphasis on preventive maintenance and safety.

**5145 Farm Machinery II****3**

Studies the setup, adjustment, predelivery performance, and calibration of the components of planters, drills, chemical and fertilizer machinery, and cultivation machinery. Emphasizes preventive maintenance and safety.

**5146 Fuels, Lubricants, and Coolants****3**

Focuses on the fuel requirements and specifications for each of the three fuels used in internal combustion engines. Studies coolant service and requirements, with emphasis on preventive maintenance.

**5147 Bearings and Seals****3**

Studies friction and antifriction bearings and dust and liquid seals, including bearing and seal installation for each type of bearing and seal and the proper preload and endplay of bearings. Emphasizes proficiency of installation as well as preventive maintenance.

### **5148 Belts and Chains 3**

Studies belt types, load ratings, and proper installation with regard to alignment of belt pulleys and tightness of belts. Covers chain types, sprocket alignment, and chain sag. Emphasizes daily preventive maintenance.

### **5149 Tires and Tracks 2**

Studies off-the-road tires, including size, composition codes, service, and maintenance. Emphasizes on-track maintenance instruction for operators and preventive maintenance and safety.

### **5154 Farm Machinery I 3**

Studies primary and secondary soil tillage tools. Includes setup, adjustment, and predelivery performance of plows, disks, harrows, multiple purpose tools, and tiller, with emphasis on operational safety precautions.

### **5156 Hydrostatic Hydraulics Systems 3**

Studies theory of fluids under high pressure but limited flow rate, as used in closed-loop positive displacement components. Also studies hydrostat motor and pump circuits with controlling components. Emphasizes preventive maintenance.

### **5157 Agricultural and Industrial Equipment Sales 2**

Studies sales methods pertaining to new and used equipment. Covers trade-downs, washout sales, scrapping procedures, business costs, pricing, sales incentive and follow-up, equipment auctions and jockey's role in price determination, and cold canvassing as a means of increasing equipment sales.

### **5158 Diesel Engines IV 2**

Includes study of V-8 diesel, pump injector, single unit, supercharger, two cycle diesel theory, areroids, and servicing for industrial servicemen.

### **5160 Chain Saw Maintenance 4**

Presents the fundamentals, operating principles, maintenance, and repair of two-cycle chain saws. Includes troubleshooting.

### **5162 Diesel Injection Nozzle Service 2**

Studies injection nozzle types and service, including procedures for timing, cleaning orifices, lapping machined areas, cracking pressure and delivery rate adjustment, proper installation into head, and torque specification.

### **5163 Internal Combustion Engines Laboratory 3**

Studies in depth the internal combustion engines typically used in the agricultural equipment industry.

### **5164 Farm Machinery III 3**

Deals with types of harvesting and handling machinery commonly used on local farms, including mowers, hay rakes and balers, grain and corn combines, forage har-

vesters, grain dryers, augers, elevators, and related equipment. Emphasizes operation safety.

### **5168 Agricultural Safety 3**

Provides in-depth study of safety factors relevant to the agricultural equipment technician.

### **5169 Preventive Maintenance 2**

Focuses on the special maintenance problems associated with many different types of costly equipment. Emphasis on keeping equipment functional and efficient.

### **5170 Farm Machinery IV 3**

Deals with fundamentals of tractor operation, including hitching, preparation, starting and stopping under load, gear selection, speed of field operation, controls, ballast, accessories, implement attachment, and operation under hazardous conditions.

### **5180 Farm Machinery V 3**

Concentrates on efficiency in farm production. Examines tractor work capacity, machinery production capacity, expected tractor and machinery depreciation, custom work, leasing, ownership, operating costs, and a long-range plan for machinery replacement.

### **5183 Hydrostatic Hydraulic Transmissions 3**

Deals with high pressure, closed loop, hydraulic power trains with no clutches, brakes or gears. Offers the latest approach to torque-variable speed transmission.

### **5184 Torque Converter Transmissions 3**

Studies the coupling of the torque converter to a hydraulic assist transmission to meet high load requirements at low speed as well as low load requirements at high speed. Both types of units are used in laboratory assignments.

### **5185 Crop Chemicals Equipment 2**

Studies the calibration of farm chemicals and the machinery used to apply them. Attention given to safety and environmental factors in using crop chemicals.

### **5186 Welding Practice for Agricultural Equipment 3**

Introduces basic welding with emphasis on procedures and techniques pertaining to agricultural equipment.

### **5187 Identification of Parts Failures 1**

Trains the service technician to quickly identify parts failures and causes of damage.

### **5313 Introduction to Fire Technology 3**

Introduces fire problems and various aspects phases of the fire technology field. Includes characteristics and behavior of fire and hazardous properties of materials.

### **5314 Fire Apparatus I** **3**

Covers all fire fighting apparatus, including aerial ladders, pumpers, elevating platforms, types of hoses, and aircraft fire apparatus. Also covers maintenance of equipment and problems of emergency driving on dry and wet roads.

### **5322 Electricity** **3**

Provides basic concepts of electricity for electrical workers. Includes series and parallel circuits, series-parallel combinations, Ohm's Law, and definitions of electromotive force, current, and resistance.

### **5323 Fire Apparatus II** **3**

Includes construction, operation, and maintenance of aerial ladders and platforms and other specialized equipment.

### **5324 Fire Department Hydraulics I** **3**

Deals with problems related to public water supply and distribution systems, including watermains, hydrants, valves, and fittings. Also demonstrates the use of pumpers to insure adequate supply and pressure.

### **5325 Fire Department Hydraulics II** **2**

Continues Fire Department Hydraulics I (5324).

### **5332 Fire Fighting Strategy and Tactics I** **3**

Trains the student to make responsible decisions concerning fire ground tactics from either battalion or company level. Provides insights into situations frequently encountered by the fire fighter.

### **5333 Fire Alarm and Protection Equipment** **3**

Presents fundamentals of municipal and local alarm systems; heat, smoke and flame detectors; telephone and tele-equipment; sprinkler systems; and protective alarm and detection systems.

### **5334 Fire Fighting Strategy and Tactics II** **2**

Continues Fire Fighting Strategy and Tactics I (5332), with emphasis on the tactical simulator.

### **5342 Hazardous Materials I** **3**

Reviews basic chemistry, storage of hazardous materials, handling laws and standards, and fire fighting practices pertaining to hazardous materials.

### **5343 Rescue Practices and Procedures** **3**

Demonstrates rescue methods, including fire rescue, auto extraction, and aircraft rescue and fire fighting procedures. Also details responsibilities of fire department in the protection of evidence at the scene of an aircraft incident.

### **5350 Applied Chemistry** **2**

Studies fundamentals of chemistry, including solutions, acids and bases, chemical

kinetics, and equilibrium. Also offers an introduction to organic chemistry, biochemistry, and industrial chemistry.

### **5351 Industrial Safety and Fire Control** **3**

Studies the principles of combustion; classes of fire; characteristics of combustibles, explosions, and backdrafts; techniques of fire control; methods of heat transfer; flashpoint burning point; ignition temperature; vapor density; use of tools and equipment; safety procedures; and protective clothing and breathing apparatus.

### **5352 Hazardous Materials II** **3**

Continues study of Hazardous Materials I.

### **5353 Fire Investigations** **4**

Covers the responsibilities of the fire investigator, with regard to fire cause and loss, collection and preservation of evidence, and determination of fire origin. Emphasis on the uses and applications of various scientific aids to investigation.

### **5360 Fire Service Inspection** **4**

Presents the organization and function of fire prevention and inspection. Includes recognition of hazards, recommendations for corrective action, engineering to solve fire hazards, and enforcement of codes and laws,

### **5361 Fire Service Organization and Management** **4**

Presents effective methods of fire service organization and management. Attention given to fire safety problems and relations with other agencies.

### **5362 Fire Department Specifications** **4**

Deals with the preparation of specifications for fire station, apparatus, hose, and other equipment.

### **5363 Fire Prevention** **4**

Studies the function and organization of fire prevention. Covers inspection, surveying, and mapping procedures.

### **5364 Legal Problems in Fire Service** **4**

Studies law as it relates to the fire fighter, fire officer, and fire investigator. Examines the laws pertaining to the organization and operation of fire departments, liability, mutual aid, arson, fire prevention, and building construction. Attention given to fire scene and courtroom procedures.

### **5370 Fire Fighting 1A** **3**

Trains the fire fighter in the basic skills needed to attain second class Fire Fighters Certification.

### **5372 Fire Fighting 2A** **3**

Presents the first half of the State-certified skills courses needed to attain first-class Fire Fighters Certification.



- 5373 Fire Fighting 2B** **3**  
 Presents the second half of the State-certified skills courses needed to attain first-class Fire Fighters Certification.
- 5374 Inspectors Course I** **3**  
 Studies the organization and functions of the Fire Prevention Bureau. Trains the inspector to make critical examinations of buildings.
- 5375 Inspectors Course II** **3**  
 Continues Inspectors Course I (5374).
- 5391 Management Essentials** **4**  
 Explores the nature of management and employee productivity and satisfaction, using small work groups as found in individual fire companies. Develops skills in planning, decision-making, and control.
- 5393 Building Materials** **3**  
 Studies the properties, applications, and costs of materials used in architectural construction.
- 5394 Aircraft Fire Fighting I** **3**  
 Trains fire department personnel to perform the tasks associated with aircraft fire rescue.
- 5395 Aircraft Fire Fighting II** **3**  
 A continuation of Aircraft Fire Fighting I (5394).
- 5396 Ship Board Fire Fighting** **3**  
 Studies fire fighting methods for land-base companies. Includes survey of equipment used, hookups, procedures, and use of water, foams, and support systems on ships.
- 5397 Radioactive Emergencies** **3**  
 Includes radiation hazards, fire fighting procedures in generating plants, transportation of equipment, and emergency situations for fire service and safety people.
- 5421 Basic Architectural Drafting** **3**  
 Presents architectural drafting equipment, scale reading, lettering, and isometric, oblique, pictorial, perspective, and free-hand sketching.
- 5422 Residential Construction Materials** **3**  
 Studies the basic materials used in residential construction and their application, with consideration to usability and cost feasibility.

- 5423 Commercial Construction Materials** **3**  
Studies materials used for commercial and industrial building construction, with consideration given to cost factors.
- 5424 Residential and Commercial Construction Materials** **3**  
Studies materials used in architectural construction. Consideration given to properties and standard sizes of structural materials and to construction techniques.
- 5430 Light Construction Presentation Drafting—Prerequisite: 7522** **3**  
Focuses on drawings for residential construction, with attention to size and space relationships.
- 5431 Light Construction Layout Drafting—Prerequisite: 7522** **3**  
Concentrates on the preparation of working drawings, with attention to foundation and floor plans, wall sections and plot plan, climate control, and electrical plans.
- 5432 Mechanical and Electrical Equipment** **3**  
Deals with mechanical and electrical systems within a structure design. Studies plumbing, climate control, and electrical systems as integrated systems.
- 5433 Light Construction Detail Drafting—Prerequisite: 5431** **3**  
Instructs in the preparation of working drawings, with attention to interior elevations, details of windows, doors, and built-in features, and scheduling.
- 5434 Fabrication Drafting** **3**  
Provides practical experience in electronics construction and assembly, with emphasis on care and use of shop tools and test equipment. Studies the techniques used in diagramming electronic circuits and systems and develops skill in reading and interpreting diagrams and electronic prints.
- 5440 Medium Construction Presentation Drafting—Prerequisite: 5433** **3**  
Concentrates on presentation drawings for buildings using masonry units. Studies size and space relationship and codes as the basis of design.
- 5441 Medium Construction Layout Drafting—Prerequisite: 5433** **3**  
Focuses on the preparation of working drawings, with attention to foundations and floor plans, roof plans, wall sections and plot plans, climate control, plumbing, and electrical systems.
- 5442 Medium Construction Detail Drafting—Prerequisite: 5443** **3**  
Deals with the preparation of working drawings, with attention to exterior and interior elevations, details of windows, doors, and built-in features, and scheduling.
- 5443 Electrical Equipment—Prerequisites: 5432, 5440** **3**  
Studies electrical components used in the construction industry. Includes calculation and design of electrical systems, spatial and structural considerations, and the selection of materials.

- 5450 Heavy Construction Presentation Drafting—Prerequisite: 5433** **3**  
 Concentrates on presentation drawings for buildings of masonry and steel construction, with attention to size and space relationships and codes as the basis of design.
- 5451 Heavy Construction Layout Drafting—Prerequisite: 5433** **3**  
 Trains in the preparation of working drawings, with attention to foundations, floor and roof plans, wall sections and plot plans, climate control, plumbing, and electrical systems.
- 5452 Estimating—Prerequisite: 5422, 5423** **3**  
 Presents concepts and principles of quantity “take-off” of building materials as required by construction contractors. Includes applications to the preparation of sets of plans.
- 5453 Heavy Construction Detail Drafting—Prerequisite: 5433** **3**  
 Instructs in the preparation of working drawings, with attention to exterior and interior elevations, details of windows, doors, and built-in features, and scheduling.
- 5454 Interactive Computer-Aided Design** **5**  
 Presents applications of computer-aided design in industrial drafting. Teaches the student to design machine parts, text, dimensions, points, lines, surfaces, and shapes with the aid of the computer.
- 5455 Architectural Computer-Aided Design** **3**  
 Develops skill in the architectural application of computer-aided design. Attention given to the dimensions and geometric elements of architectural design.
- 5456 Introduction to Computer-Aided Design** **3**  
 Introduces computer-aided design system capabilities and uses. Also presents the fundamentals of programming.
- 5457 Three-Dimensional Computer-Aided Design** **5**  
 Includes lectures and practical experience on 3-D drawings and 3-D software.
- 5458 Computer-Aided Mapping** **3**  
 Instructs in topographic mapping, plat mapping, grid systems, contour lines, and the calculation of distance and area, using the computer-aided drafting system.
- 5459 Computer-Aided Printed Circuit Board Design** **3**  
 Instructs in electric schematics, schematic symbols, and printed circuit boards; also provides lab experience in using the circuit board.
- 5460 Team Project Presentation Drafting—Prerequisite: 5433** **3**  
 Develops skills in presentation drawings for industrial or residential buildings.

- 5461 Team Project Layout Drafting** **3**  
Instructs in the preparation of working drawings, with attention to foundations, floor and roof plans, wall sections and plot plans, climate control, plumbing, and electrical systems.
- 5462 Team Project Detail Drafting** **3**  
Instructs in the preparation of detailed drawings, with attention to exterior and interior elevation, window and door details and schedules, and built-in features.
- 5463 Structural Design and Drafting** **3**  
Introduces practical applications of theories learned in Statics (7551) and Strength of Materials (7552) to architectural and structural engineering. Covers the design of simple footings; foundation walls; steel columns, beams, and roof systems; and wooden trusses. Also includes the design and drawing of structural connections and joints in structural shop drawings.
- 5470 Business Presentation Drawing** **4**  
The student will complete, with instructor's approval, a set of working drawings for an office building or for light industry. Includes assimilation and computing of data as needed.
- 5471 Surveying Theory** **3**  
Presents the fundamentals of surveying. Also covers the use and care of surveying equipment, including level and transit.
- 5472 Surveying Field Problems—Prerequisite: 5471** **2**  
Provides class field experience in chaining, running a traverse, running a level circuit, and keeping an accurate field book.
- 5473 Architectural Rendering** **3**  
Presents a survey and history of pictorial drawings. Studies light and color, rendering of media, and application of different techniques and media through a series of exercises.
- 5474 Plat Mapping** **3**  
Studies land boundary relationships with respect to the common domain system of surveying. Emphasis on latitude and departure system of drawing layout, areas determination, and use of aerial photographs.
- 5475 Topographic Map Drafting** **3**  
Provides experience in topographical surveying, methods of establishing grades, and estimating quantities required for cuts and fills.
- 5476 Business Principles** **3**  
Presents fundamentals of economics, business, and industry, with emphasis on principles pertaining to building construction and architectural design. Includes study

of architect-client and architect-contractor relationships and the financial operations of the architectural organization.

### **5477 Model Building 3**

Studies the construction of small scale, three-dimensional drafting projects. Considers appearance, function, landscaping, and structural design of customer presentations.

### **5478 Specifications and Codes 3**

Covers contracts and specifications pertaining to plans, buildings, codes, and construction practices. Considers relationships between specifications and working drawings from both legal and practical standpoints.

### **5482 Piping System - Draft and Design I 3**

Discusses drafting methods, pipe supports, pipe fabrication, isometrics, flow diagrams, and instrumentation. Includes lab work on various drawing problems.

### **5483 Piping System - Draft and Design II 3**

Continues Piping System - Draft and Design I (5482).

### **5484 Pipe Drafting 3**

Continues study of pipe drafting, with instruction in petrochemical, conventional power, nuclear power, and solar power piping.

### **5485 Medium Construction Structural Drafting 3**

Introduces precast concrete plans, sections, connections, and details appropriate to the designing of the model. Includes study of structural poured-in-place concrete and poured stairs and ramps.

### **5486 Heavy Construction Structural Drafting 3**

Provides practical experience on a drafting project; includes study of components.

### **5490 Graphics Programming 4**

Introduces graphics, including high resolution graphics and two- and three-dimensional concepts related to cad and software development in plotting circles, scaling, and rotation.

### **5491 Basic Programming 4**

Presents fundamentals of programming as applied to engineering and design. Includes terminology, flowcharts, editing, loops and files.

### **5492 Computer Operations 3**

Introduces basic programming and software operations for use in various fields of study.

- 5515 Bank Security** 4
- Studies principles and practices of security measures for banks and other financial institutions, with attention to federal and state standards.
- 5522 Safety and Fire Prevention** 4
- Includes principles and practices of safety, management of the safety program, interpretation and application of safety regulations, fire prevention and control, property conservation occupational hazards, and personal safeguards.
- 5530 Principles of Loss Prevention** 4
- Provides an overview of the functional operations in specialized areas of security, including theft and risk control, security surveys, and loss prevention management in proprietary and governmental institutions.
- 5601 Basic Body Repair I** 2
- Deals with the characteristics of body metals and the installation of moldings, ornaments, and fasteners.
- 5602 Basic Body Repair II** 2
- Presents the care and use of hand and power tools and equipment, with emphasis on tool and shop safety. Includes analysis of damaged sheet metal.
- 5603 Basic Body Repair III** 2
- Studies advanced techniques of body repair, with emphasis on grinding, picking, filing, and plastic applications in the repair of minor damage.
- 5604 Basic Body Repair IV** 2
- Introduces skills used in preparing automobiles for painting. Includes cleaning, masking and sanding.
- 5605 Auto Body Power Tools** 4
- Covers the diagnosis of problems concerning the use and application of power tools.
- 5606 Auto Body Hand/Hydraulic Tools** 4
- Covers the selection, usage, and maintenance of hand tools for auto body repair.
- 5607 Basic Body Repair III—Practicum** 1
- Supplements Basic Body Repair III (5603).
- 5608 Basic Body Repair IV—Practicum** 1
- Supplements Basic Body Repair IV (5604).
- 5609 Basic Body Repair I—Practicum** 1
- Supplements Basic Body Repair 1 (5601).

<b>5611 Collision Damage Repair I</b>	<b>2</b>
Prepares students to analyze extensive body damage and to determine the tools and procedures needed to replace panels.	
<b>5612 Collision Damage Repair II</b>	<b>2</b>
Continues study of panel replacement fundamentals, with emphasis on skill development.	
<b>5613 Collision Damage Repair I—Practicum</b>	<b>1</b>
Supplements Collision Damage Repair 1 (5611).	
<b>5614 Collision Damage Repair II—Practicum</b>	<b>1</b>
Supplements Collision Damage Repair II (5612).	
<b>5615 Basic Body Repair II—Practicum</b>	<b>1</b>
Supplements Basic Body Repair II (5602).	
<b>5616 Automotive Chassis and Accessory Circuits</b>	<b>3</b>
Introduces fundamentals of electrical theory, automotive components and circuits, and troubleshooting techniques. Emphasis placed on battery construction, function, and operation.	
<b>5617 Suspension and Alignment for Auto Body</b>	<b>3</b>
Studies the suspension and steering parts of an automobile and the theory of wheel alignment and wheel balance. Covers the five wheel alignment angles, steering wheel positioning, vehicle tracking, and wheel balancing.	
<b>5620 Frame and Chassis I</b>	<b>2</b>
Demonstrates use of tools and frame machines for frame and chassis repair. Includes study of terms pertaining to front suspension and rear axle.	
<b>5621 Frame and Chassis II</b>	<b>2</b>
Continues Frame and Chassis I (5620), with emphasis on conditions found in frame damage. Includes use of frame gauges, team gauges, and other measuring devices.	
<b>5622 Frame and Chassis III</b>	<b>2</b>
Develops skill with equipment used to attach car to frame machine. Emphasis on correction of minor frame misalignments.	
<b>5623 Frame and Chassis IV</b>	<b>2</b>
Emphasizes the repair of major frame damage. Includes inspections, analyses and procedures for restoring body structure alignment, and unibody automobiles.	

**5624 Auto Body Welding I 2**

Studies the applications of welding techniques in the replacement and repair of panels, with emphasis on techniques peculiar to automotive body repair.

**5625 Auto Paint Shop Practice I 2**

Introduces auto painting, with emphasis on the handling of material and equipment.

**5626 Auto Body Sheet Metal Alignment 2**

Demonstrates alignment of sheet metal, doors, trunks, and glass, body sealing, maintenance, and elimination of rattles. Provides practical experience in the alignment of all body panels and glass, with attention to appearance, operation, and finishing (sealing) of parts.

**5627 Auto Paint Shop Practice I—Practicum 1**

Supplements Auto Paint Shop Practice I (5625).

**5628 Frame and Chassis III—Practicum 1**

Supplements Frame and Chassis III (5622).

**5630 Collision Damage Appraising 2**

Studies the use of estimation guides, procedures for itemizing damage, meanings of abbreviations, numbers of parts, and the use of time and money conversion tables. Emphasizes damage inspection, recording on estimate sheets, and calculation of costs.

**5631 Upholstering 2**

Presents techniques of automobile interior refinishing. Includes study of spring construction, filling, and fabrics. Develops manipulative skills through practice projects on seats, panels, and arm rests.

**5632 Auto Paint Shop Practice II 2**

Covers theory and procedures pertaining to spot repair and total car refinishing.

**5633 Aluminum Panel Fabrication and Repair 2**

Introduces the tools, materials, and processes used in the fabrication and repair of aluminum panels.

**5634 Auto Paint Shop Practice II—Practicum 1**

Supplements Auto Paint Shop Practice II (5632).

**5635 Frame and Chassis II—Practicum 1**

Supplements Frame and Chassis II (5621).



- 5636 Auto Paint Refinishing** **2**  
 A continuation of auto painting, including the total refinishing of an auto. Emphasizes treatment of the auto as a complete unit.
- 5637 Custom Paint Refinishing** **2**  
 Continues auto painting, with emphasis on metallic finishes, air brush work, blending of colors, and working up new strippings. Also introduces the first steps in art work.
- 5638 Glass Installation** **2**  
 Focuses on different types of automobile glass and their uses. Demonstrates how to remove and install front and rear glass, install and adjust side glass, bond the rearview mirror support, and use rubber channel and synthetic rubber adhesive.
- 5639 Fiberglass/Plastic Repair** **2**  
 Introduces types of fiberglass and plastic materials used in auto body repair. Covers both interior and exterior applications.
- 5640 Auto Paint Refinishing—Practicum** **1**  
 Supplements Auto Paint Refinishing (5636).
- 5642 Welding Practice For Auto Body I** **3**  
 Introduces basic welding procedures pertaining to automotive body repair, with emphasis on safety. Includes welding techniques specific to auto body repair.
- 5801 Engine Tune-up and Testing** **3**  
 Presents techniques for testing conventional and electronic ignition systems, the fuel system, and emission controls. engine detailed testing Also includes engine testing and tune-up.
- 5811 Automotive Chassis and Suspension—Practicum** **1**  
 Supplements Automotive Chassis and Suspension (5812).
- 5812 Automotive Chassis and Suspension** **3**  
 Studies various frame designs used in automobile construction and suspension components. Demonstrates the repair and service of ball joints, idler arms, tie rod ends, and other suspension components.
- 5813 Automotive Braking Systems** **3**  
 Studies the theory, service, and repair of automotive braking systems and their components. Emphasis on hydraulic theory and the repair and service of booster units, master cylinder, wheel cylinder, caliper rebuilds, and drum and rotor service.
- 5814 Automotive Front End Alignment—Corequisite: 5812** **3**  
 Studies fundamentals of wheel alignment and wheel balance, including each of the five wheel alignment angles, steering wheel positioning, vehicle tracking, and wheel balancing.

- 5816 Welding Practice For Agriculture Equipment** **3**  
 Introduces basic welding procedures pertaining to agricultural equipment, with emphasis on safety. Includes welding techniques specific to agricultural equipment.
- 5817 Automotive Braking Systems—Practicum** **1**  
 Supplements Automotive Braking Systems (5813).
- 5818 Automotive Braking System Applications** **3**  
 Correlates principles, techniques, and procedures pertaining to various types of hydraulic braking systems used in the automotive field.
- 5819 Chassis and Suspension Applications** **3**  
 Correlates principles, techniques, and procedures pertaining to various types of front end alignments used in the automotive field.
- 5821 Engine Theory, Design, and Construction** **3**  
 Covers internal combustion engines, including theory of operation, design characteristics, construction, and diagnosis of problems.
- 5822 Engine Tools and Equipment** **3**  
 Familiarizes students with the tools, machines, and equipment needed for rebuilding internal combustion engines.
- 5823 Basic Electricity** **3**  
 Introduces electrical theory and automotive circuits and components. Emphasis on construction, function, and principles of battery operation.
- 5824 Front End Alignment—Practicum** **1**  
 Supplements Automotive Front End Alignment (5814).
- 5825 Fuel and Carburetion—Theory and Circuits** **3**  
 Studies automotive fuels, carburetor fundamentals, circuits, and diagnosis procedures.
- 5826 Fuel and Carburetion—Overhaul—Prerequisite: 5825** **3**  
 Demonstrates shop procedures for troubleshooting, repairing, and replacing or overhauling fuel system components.
- 5827 Conventional Ignition Systems** **3**  
 Studies conventional breaker point ignition system components, functions, operating principles, and testing procedures.
- 5828 Electronic Ignition Systems** **3**  
 Presents basic principles of electronics, with emphasis on the electronic ignition systems used in today's automobiles.

<b>5829 Electronic Ignition Systems—Practicum</b>	<b>1</b>
Supplements Electronic Ignition Systems (5828).	
<b>5832 Starting and Charging Systems—Testing—Prerequisites: 5823</b>	<b>3</b>
Studies construction, function, and principles of the operation and testing of automotive electrical units. Includes starting motors, batteries, and charging systems.	
<b>5833 Starting and Charging Systems—Overhaul—Prerequisites: 5823, 5832</b>	<b>3</b>
Develops a comprehensive understanding of all electrical components and systems, with emphasis on problem diagnosis and bench repair of units.	
<b>5834 Engine Overhaul—Prerequisite: 5822</b>	<b>3</b>
Covers tear-down, inspection, measuring, cleaning, machining, repair, and assembly techniques pertaining to engine overhaul. Attention also given to cooling systems.	
<b>5835 Manual Transmission Overhaul</b>	<b>3</b>
Studies theory, operation, troubleshooting, and repair of power train, with emphasis on operation and maintenance of clutches and manual transmissions.	
<b>5836 Engine Overhaul—Practicum</b>	<b>1</b>
Develops skills in tear-down, inspection, measuring, cleaning, machining, repair, and assembly techniques used in engine overhaul. Includes work on cooling and lube systems.	
<b>5837 Introduction to Automotive Service</b>	<b>3</b>
Presents an overview of the automotive service industry. Leads the student through discussion of selected topics toward a professional understanding of the field.	
<b>5838 Engine Overhaul II—Practicum</b>	<b>1</b>
Supplements Engine Overhaul (5834).	
<b>5839 Engine Overhaul III—Practicum</b>	<b>1</b>
Supplements Engine Overhaul (5834).	
<b>5840 Engine Overhaul IV—Practicum</b>	<b>1</b>
Supplements Engine Overhaul (5834).	
<b>5842 Automotive Diesel Engine Overhaul I</b>	<b>3</b>
Covers the 2- and 4-stroke diesel engine, including review of automotive diesel engine theory; operation and repair of the valve train; cylinder block components; lube, fuel, and cooling systems and components; and engine rebuilding techniques and diagnosis.	
<b>5843 Differentials and Rear Axle Overhaul</b>	<b>3</b>
Continues study of the power train, with focus on the transfer of power from the	

engine to the wheels. Emphasis placed on universal joints, differentials, and rear axle assemblies.

#### **5844 Advanced Tune-up—Practicum 1**

Supplements Advanced Tune-up (5845).

#### **5845 Advanced Tune-up—Prerequisite: 5852 3**

Outlines diagnostic procedures and stresses the importance of troubleshooting. Special attention given to factors that assure good automotive performance. Provides laboratory experience in diagnosis and evaluation.

#### **5846 Vehicle Inspection and Safety 2**

Studies federal and state regulations concerning automotive safety devices and their operation. Emphasis on methods of vehicle inspection used to determine compliance with federal and state laws.

#### **5847 Air Conditioning—Theory, Service, and Components 3**

Studies theory, function of components, and normal minor service maintenance.

#### **5848 Air Conditioning—Diagnosis and Repair—Prerequisite: 5847 3**

Covers diagnosis of air conditioning malfunctions and the repair, replacement, and overhaul of components.

#### **5849 Automotive Diesel Engine Overhaul II 3**

Continues Automotive Diesel Engine Overhaul I (5842). Covers diesel engine rebuilding techniques and procedures in greater detail, with emphasis on lab practice.

#### **5850 Automotive Diesel Engine Theory 3**

Studies the automotive diesel engine, including theory of operation, design characteristics, component nomenclature, component relationships, component location, and basic diagnostic techniques.

#### **5851 Automotive Accessories—Prerequisite: 5823 3**

Studies the function, construction, and operating principles of automotive accessories, including lighting and signalling systems, headlight dimmers, electrically-operated safety devices, buzzers, flashers, and electric motor-operated devices. Emphasis placed on troubleshooting techniques.

#### **5852 Engine Tune-up—Prerequisites: 5823, 5825, 5826, 5828, 5832, 5833 3**

Studies the principles of automotive engine and component operation that support good performance. Provides laboratory experience in diagnosis, evaluation, and complete tune-ups.

#### **5853 Engine Tune-up—Practicum 1**

Supplements Engine Tune-up (5852).

- 5854 Automatic Transmission Theory and Operation** **3**  
 Studies automatic transmissions, including construction, function, and principles of operation. Emphasis on power flow within transmission.
- 5855 Automatic Transmission—In-Car Service—Prerequisite: 5854** **3**  
 Studies operational diagnosis and preventive maintenance servicing of automatic transmissions.
- 5856 Automatic Transmission—Bench Overhaul I—Prerequisite: 5855** **3**  
 Offers practical experience on transmission simulations and components.
- 5857 Automatic Transmission—Bench Overhaul II—Prerequisite: 5856** **3**  
 Offers theory and practice in the overhaul of automatic transmissions. Includes diagnosis and testing and correction of malfunctions on live transmissions.
- 5858 Automatic Transmission—Bench Overhaul I - Practicum** **1**  
 Supplements Automatic Transmission Bench Overhaul I (5856).
- 5859 Motorcycle Maintenance** **3**  
 Covers general motorcycle maintenance, with emphasis on preventive maintenance, tire changing, and engine tune-up. Includes pre-ride inspection, clutch and brake adjustments, battery service, and changing fork oil.
- 5860 Emissions Control** **3**  
 Introduces the purpose and function of emissions control systems. Also covers diagnosis, repair, and maintenance of components of the systems.
- 5861 Automotive Blueprint Reading** **4**  
 Presents fundamentals of blueprint reading and sketching as they apply to automobile components.
- 5862 Comprehensive Diagnosis and Procedures I** **3**  
 Develops advanced skills in diagnosis and in major and minor repair to journeyman's standards in a minimally supervised work environment, similar to that of an automotive service center.
- 5863 Comprehensive Diagnosis and Procedures II** **3**  
 Continues Comprehensive Diagnosis and Procedures I (5862).
- 5864 Automotive Parts Handling** **3**  
 Studies facility and personnel requirements of an efficiently run parts department. Emphasis on principles, practices, and procedures, using a profitable operation as an example. Familiarizes student with manufacturers' catalogs and component numbering systems, and demonstrates techniques for installing and maintaining a practical inventory control system.

- 5865 Service Organization and Management** **3**  
 Studies methods of work and time scheduling in the service shop and techniques of obtaining maximum work efficiency from mechanics and specialists. Includes general principles of service station sales, service, and customer relations.
- 5866 Occupational Safety and Health for Auto Service Environment** **4**  
 Introduces principles and techniques pertaining to occupational safety and health.
- 5867 Basic Shop Practice** **2**  
 Studies fundamental shop procedures, safety, tools, and machines.
- 5868 Small Engine Maintenance** **3**  
 Covers theory of operation, service, and adjustment of small engines. Emphasis on development of skills in the diagnosis, repair, and rebuilding of small engines.
- 5869 Recreational Vehicle Maintenance** **3**  
 Studies the special characteristics and maintenance problems of recreational vehicles.
- 5870 Common Auto Sense I** **2**  
 Provides an introduction to the modern automobile. Includes routine maintenance, economical operation, elimination of objectionable noises, interior and exterior appearance, and warranty regulations.
- 5873 Automatic Transmission—Bench Overhaul II—Practicum** **1**  
 Supplements Automatic Transmission—Bench Overhaul II (5857).
- 5874 Comprehensive Diagnosis II—Practicum** **1**  
 Provides extended experience in a work environment typical of automotive service centers. Develops advanced skills in vehicle diagnosis and repair.
- 5875 Diagnostic Applications I** **3**  
 Applies conventional tune-up principles, techniques, and procedures to engines of various designs.
- 5876 Engine Overhaul Application** **3**  
 Applies engine overhaul principles, techniques, and procedures to engines of various designs.
- 5877 Niasse Mechanic's Certification Refresher Course** **3**  
 Reviews the material covered on the Niasse Mechanics Certification Tests and familiarizes students with the testing styles used in the exams.
- 5878 Basic Shop Practices Practicum** **1**  
 Develops skills in the use of basic hand tools through planned shop exercises.

- 5879 Welding Practice for Auto Service I** **3**  
 Introduces basic welding procedures pertaining to automotive service, with emphasis on safety. Includes techniques specific to auto service.
- 5881 Domestic Diesel Engine Theory** **3**  
 Familiarizes students with the automotive diesel engine. Studies the operating principles and identifies the major subsystems. Provides training in the servicing of intake and exhaust systems and cooling and lubrication systems.
- 5882 Domestic Diesel Fuel System Service—Prerequisite: 5881** **3**  
 Offers thorough study and application of domestic diesel fuel system service. Demonstrates how to make adjustments on fuel system components, replace injector lines and injectors, bleed fuel systems, replace injector pump, test and replace glow plugs, and test injector pump housing fuel pressure.
- 5883 Domestic Diesel Engine Diagnostics—Prerequisite: 5882** **3**  
 Provides in-depth study of automotive diesel engine diagnostic procedures. Using a GM-350 C.I.D. engine coupled to an engine dynamometer, students will graph the performance of a diesel engine under conditions determined by the instructor.
- 5890 Small Gas Engine Overhaul** **3**  
 Covers disassembly, inspection, measuring, cleaning, machine repair, and assembly techniques used in the overhaul of small gas engines. Also includes the overhaul of carburetors and ignition systems and the maintenance and rebuilding 2- and 4-cycle engines.
- 5891 Computerized Engine Control Systems** **3**  
 Studies the major components of computerized engine controls that govern fuel, ignition, and emission systems. Includes diagnostic testing techniques designed to monitor and improve performance, increase fuel economy, and reduce emissions.
- 6001 Carpentry Fundamentals** **3**  
 Presents the history of the carpentry trade, traditional and progressive building techniques, and current construction methods and trends.
- 6002 Construction Tools and Skills** **3**  
 Studies the use of various types of construction tools. Emphasis on safety, maintenance, and skill development.
- 6003 Construction Materials** **3**  
 Describes the materials used in the building industry and studies in depth the manufacturing process and systems of purchasing.
- 6004 Safety and First Aid** **3**  
 Studies principles of safety and first aid procedures and techniques applicable to trade and industry. Includes a practicum in environmental emergency care and effective safety protection.

- 6011 Floor and Wall Layout and Construction** **3**  
 Covers the design and construction of floor and wall systems and develops the skills needed for layout.
- 6012 Roof Construction** **3**  
 Studies the design and construction of roof systems. Emphasizes use of the framing square.
- 6013 Blueprint Reading I** **3**  
 Provides instruction and practice in the use of working drawings. Attention given to the relationship of view and details, interpretation of dimensions, transposition of scale, tolerances, electrical symbols, sections, material symbols and lists, architectural plates, room schedules, and plot plans.
- 6014 Electrical Wiring Fundamentals** **3**  
 Studies basic electricity, including electron theory, Ohm's Law, use of electrical measuring instruments, simple series and parallel circuits, switching devices, and fusing.
- 6015 Residential Wiring** **3**  
 Covers the practice of residential wiring, including electrical service, metering equipment, lighting, switches, outlets and other common components, installation, and maintenance.
- 6016 Electrical Wiring I** **3**  
 Studies the care and safe use of electrical wiring tools and equipment. Emphasizes safety measures for the prevention of fires while working with electricity.
- 6017 Electrical Installation I** **3**  
 Studies interior wiring systems and methods of installation. Trains the student to assess the types and quantity of wire needed and to select appropriate methods and equipment for an installation.
- 6018 Electrical Wiring II** **3**  
 A continuation of Residential Wiring (6015). Covers residential service, metering equipment, and branch circuiting.
- 6020 Electrical Blueprint—Prerequisite: 6015** **3**  
 Studies common blueprint problems encountered by electricians in commercial building. Trains the student to translate blueprint information into appropriate methods of installation.
- 6021 Carpentry—Advanced Framing—Prerequisites: 6011, 6012** **3**  
 Studies the layout and construction of floors, walls and roofs, with emphasis on skill development and time factors in framing.



- 6022 Plumbing Design and Installation I** **3**  
Presents techniques for working with pipes and fittings. Demonstrates how to rough in plumbing and how to install drainage, water systems, fixtures, and water heaters in compliance with the plumbing code.
- 6023 Blueprint Reading II** **3**  
Develops proficiency in the interpretation of more complex blueprints. Studies notations and conventional symbols and dimensions and introduces the fundamentals of mechanical drafting.
- 6024 Plumbing Fundamentals** **3**  
Studies the operation and function of the home plumbing system. Introduces pipe drawings and isometric pipe layout, blueprint symbols, and use of an architect's scale.
- 6025 Plumbing Blueprint** **3**  
Develops skill in reading, comprehending, and interpreting blueprints for residential plumbing. Covers pipe drawings and isometric pipe layout, blueprint symbols, and use of an architect's scale.
- 6026 Advanced Skills in Masonry—Prerequisite: 6036** **3**  
Covers building of corners, wall reinforcing, masonry supports, chases, small one-flue chimneys, corbelling, and wall copings. Emphasis on residential veneering, cavity wall construction, concrete reinforcement, and special finishes.
- 6027 Masonry Estimating and Specifications—Prerequisites: 6013, 6023, 6036** **3**  
Studies masonry specifications, line and symbol identification, and dimensioning and scaling in working drawings. Emphasis on residential construction.
- 6028 Plumbing Design and Installation II** **3**  
Continues Plumbing Design and Installation I (6022).
- 6029 Plumbing Design and Installation III** **3**  
Studies residential and commercial electric hot water heating systems, private well water systems, and their electrical components.
- 6030 Electrical Estimating—Prerequisite: 6020** **3**  
Studies building plans and specifications, takeoffs and quantity surveys, current pay scales, and materials and labor costs.
- 6031 Electrical—Commercial Wiring—Prerequisites: 6014, 6015** **3**  
Introduces wiring methods and materials in conformance with the National Electrical Code. Covers the fundamentals of mechanical and electrical installations, with emphasis on tool usage and material selection.
- 6032 Exterior Trim** **3**  
Demonstrates and develops skills pertaining to the exterior finishing of a building. Covers installation of cornice, windows, doors, and various types of sidings.

**6033 Interior Trim****3**

Demonstrates how to measure accurately, cut and fit moldings, install panelling and finish flooring, hang doors, and install hardware and cabinets.

**6034 Millwork****3**

Provides a basic knowledge of cabinetry and millwork.

**6035 Plumbing Estimating—Prerequisites: 6022, 6024, 6025****3**

Instructs how to estimate the cost of a complete plumbing system. Includes compiling quantity surveys and takeoff from blueprint specifications, labor costs, types of material, and necessary equipment.

**6036 Masonry and Concrete Fundamentals—Prerequisites: 6002, 6003****3**

Covers materials and methods of construction, building layout, preparation of building site, footings and foundations, and wall construction, including form construction and erection. Emphasis on the use of masonry tools and materials and the properties of brick and concrete block.

**6037 Electrical Troubleshooting Techniques****3**

Presents methods and techniques for troubleshooting appliances, motors, motor starters, relay wiring, and residential wiring systems.

**6041 Special Problems in Masonry Construction—Prerequisite: 6036****3**

Studies chimneys, stone and rock masonry, metal preformed fireplaces, archways and supporting openings in masonry, and chimney design and sizing.

**6043 Sheet Metal****3**

Studies metal framing materials used in residential and light commercial construction and exterior siding and cornice installation.

**6044 Survey and Measurement****3**

Offers an introduction to surveying. Discusses use of transit, reading angles, land descriptions, restrictions, and legal problems. Presents topographical maps and their uses.

**6045 Special Problems in Concrete—Prerequisite: 6036****3**

Studies different types of concrete finishes, reinforcing, footing designs, and waterproofing construction techniques, with attention to jointing requirements, design mixes, and curing procedures.

**6046 Aluminum Siding Application and Residential Metal****3**

Trains in the installation of aluminum siding, soffits, cornices, rain gutters, trims, and windows. Covers raised seam and corrugated metal roofing, metal carports, awnings, metal storage buildings, ventilators, and flashings.

- 6047 Cabinetry** **3**  
 Provides training and skills in cabinet building. Covers construction, installation, hardware, and countertops.
- 6048 Industrial Wiring—Prerequisites: 6014, 6015** **3**  
 Covers wiring methods and materials in conformance with the National Electrical Code. Emphasis on AC/DC machines and controls.
- 6049 Commercial Installations—Plumbing** **3**  
 Offers in-depth study of commercial plumbing, with emphasis on code requirements and commercial blueprints. Includes plumbing for schools, office buildings, and churches.
- 6050 Advanced Masonry and Design—Prerequisite: 6036** **3**  
 Studies masonry building design and the planning of a structure using masonry units. Also covers fireplace construction techniques and the selection of materials.
- 6051 Remodeling and Addition** **3**  
 Examines problems encountered in the remodeling of residential and light commercial buildings. Attention given to materials, utilities, permits, financing, and construction.
- 6052 Cabinetry and Millwork** **3**  
 Develops skills in the combined areas of cabinetry and millwork.
- 6053 Electrical Installation—Prerequisites: 6014, 6015** **3**  
 Studies practical applications of wiring and design. Includes circuit and conductor calculations, motor circuits and controls, transformer and entrance layouts, illumination design, machine tool hookup, and circuiting.
- 6054 Electrical and Plumbing—Mechanical Installation** **3**  
 Develops skills in the use of electrical and plumbing equipment. Covers residential and commercial installations, troubleshooting, service, and repair in conformance with codes.
- 6055 Mechanical Installation** **3**  
 Studies the operation of mechanical equipment and the installation of air conditioning, heating, cooling, humidification, and air cleaning systems that use this equipment. Includes the coordination of carpentry work with the installation of mechanical equipment.
- 6056 Estimating and Specifications—Carpentry—Prerequisites: 6013, 6021, 6023** **3**  
 Studies methods of estimating building costs, with emphasis on specifications, labor, and material takeoff and pricing.
- 6057 Advanced Survey** **3**  
 Covers subdivision layouts, property zoning, easements, restrictions, legal

descriptions, and building lines. Instructs in solving area problems for angles and the use of trigonometry to calculate length and area.

### **6058 Introduction to Woodworking 3**

Surveys employment areas and opportunities in woodworking industries and instructs in the operation of various types of woodworking machinery.

### **6059 Principles of Woodworking 3**

Provides experience in the use of hand tools and machines. Progresses from elementary to advanced woodworking projects.

### **6060 Advanced Residential Design 3**

Studies floor plans and elevations for residential housing, including duplexes, apartments, and condominiums. Also studies arrangements suited to contemporary living, the satisfaction of human needs with regard to costs, privacy, convenience, and efficiency, and the aesthetic values and costs of different exterior styles. The student will prepare a perspective drawing incorporating research of the above factors.

### **6061 Basic Painting and Staining 3**

Demonstrates the application of paints and stains commonly used in the construction industry. Attention given to the preservation functions of paints and stains and to the selection of materials for various decors.

### **6062 Wall and Floor Coverings 3**

Studies modern interior floor and wall covering materials and the procedures used in installing them. Illustrates how different materials may affect decor. Includes assessment of the durability of commonly used materials and maintenance instruction.

### **6064 Landscape Architecture and Design—Prerequisites: 6013, 6023 3**

Examines problems of residential, commercial, and recreational landscaping. Evaluates formal and informal designs with regard to use. Includes patios, fencing, plantings, and pools, with attention to topography, orientation, layout, trends, color, shape, scale, form, function, and costs.

### **6065 Cabinetry I 3**

Introduces the basic skills and technology of cabinetmaking, focusing on cabinet designs and layout, terminology, tools, and skill requirements.

### **6067 Cabinetry II 3**

Covers the construction, design, and layout of kitchen cabinets, with emphasis on use of tools and materials.

### **6068 Carpentry for Cabinetmakers 3**

Introduces basic carpentry, with attention to floor, wall and roof systems; interior trim, remodeling, terminology, construction methods, and layout of projects.

- 6069 Millwork I** **3**  
 Covers the production of wood products using millwork technology. Presents the setup and operation of machinery and demonstrates techniques involving joints, fasteners, hardware, and wood materials for making moldings, door frames, picture frames, and window sashes.
- 6072 Construction Project Management** **3**  
 Introduces the planning, scheduling, and execution of construction projects, with special attention to concepts presented in Program Evaluation and Review Technique (Pert) and Critical Path Method (CPM).
- 6073 Project Estimating** **3**  
 Covers bidding procedures, including content and form. Special attention given to estimation of overhead and profit.
- 6074 Energy Conservation Technology** **3**  
 Provides an overview of energy conservation techniques in current use or development. Examines new materials, construction methods, and alternative approaches to energy conservation in new and existing structures.
- 6075 Solar Energy Concepts** **3**  
 Provides in-depth study of the solar energy industry. Gives critical examination to solar energy concepts and devices and to the claims made for them.
- 6076 Electrical Installation II** **3**  
 Covers practical applications of electrical wiring and design, including circuit and conductor calculations, motor circuits and controls, transformer and entrance layouts, illumination design, and machine tool hook-up and circuiting.
- 6080 Auxiliary Building Design and Construction** **3**  
 Develops carpentry skills pertaining to the construction of garages, storage barns, wood decks and patios, gazebos, and fences. Complements other courses in residential construction.
- 6081 Fabrication—Modular Techniques** **3**  
 Studies concepts and techniques of modular construction. Covers prefabrication, fabrication, and the erection of modular units assembled at the job site.
- 6082 Building Additions** **3**  
 Focuses on the design and construction of additions to existing structures. Includes matching styles, materials, floor level and overhangs, connecting roofs, slopes, foundation, wiring, heating, and workmanship.
- 6083 Construction Organization and Procedures** **3**  
 Introduces construction organization and management procedures, with attention to work and subcontractor schedules, inventories, ordering of materials, finances, building codes, inspections, and permits.

- 6087 Millwork II** **3**  
Continuation of Millwork I (6069).
- 6088 Cabinetry III** **3**  
Develops skills in the design, layout and construction of cabinets. Student will design and fabricate a complete set of kitchen cabinets, including the construction and mounting of the counter top.
- 6089 Advanced Projects in Cabinetry and Millwork** **3**  
A continuation of Advanced Projects in Building Construction (6094). Students demonstrate their knowledge and skills through execution of designated construction projects under limited supervision.
- 6090 Advanced Projects in Building Construction I** **3**  
A continuation of Advanced Projects in Building Construction (6094). Students demonstrate their knowledge and skills through execution of designated construction projects under limited supervision.
- 6091 Carpentry—Light Commercial** **3**  
Introduces carpentry skills required in light commercial construction. Focuses on construction methods and materials used for office buildings, clinics, small churches, and other non-residential structures.
- 6093 Special Problems in Building Construction** **3**  
Examines construction problems and possible solutions.
- 6094 Advanced Projects in Building Construction** **3**  
Students demonstrate their knowledge and skills through execution of designated construction projects under limited supervision.
- 6095 Construction Research** **3**  
Offers opportunities for field projects or case studies within the student's occupational specialty. Projects and studies may include actual work experience in business or industry and/or the collection and analysis of research data.
- 6097 Advanced Projects in Building Construction II** **3**  
A continuation of Advanced Projects in Building Construction (6094). Students participate, under limited supervision, in a class project involving layout and construction of a small building.
- 6098 Construction Foreman Supervisory Training** **3**  
Covers the duties and responsibilities of the supervisor of a construction crew. Gives attention to adjusting to the role of supervisor and indicates what to expect from each member of the crew.

- 6099 Construction Foreman Supervisory Training II** **3**  
A continuation of Construction Foreman Supervisory Training (6098). Develops leadership techniques and abilities to deal with special problems in daily work.
- 6216 Electrical Fundamentals** **3**  
Covers the fundamentals of electricity and electrical circuits as applied to electrical systems on gasoline and diesel powered units.
- 6217 Diesel Electrical Systems Overhaul—Prerequisite: 6223** **3**  
Studies electrical systems design, construction, function, and operation of advanced diesel charging and cranking systems. Includes diagnosis, repair, overhaul, and testing of circuits and components of the charging and cranking systems.
- 6218 Diesel Engine Reassembly and Testing—Corequisite: 6227** **3**  
Covers the reassembly of diesel engines and testing to determine if engine parts are within allowable tolerance limits. Also covers restoration of the unit to manufacturer's specifications.
- 6220 Diesel Engines I** **3**  
Covers the construction and operation of 2- and 4-cycle diesel engines, with special attention to valves, sleeves, and bearings. Laboratory work includes the building of a diesel engine.
- 6223 Diesel Electrical Systems I** **3**  
Studies electrical systems design, construction, function and operation of diesel charging and cranking systems. Includes diagnosis, repair, and testing of circuits and components of the charging and cranking systems.
- 6224 Tune-up Procedures Theory** **4**  
Presents technical and operating principles of the ignition system and complete tune-up procedures.
- 6225 Tune-up Shop I** **3**  
Provides experience in testing and tuning all types of machines, with emphasis on the use of modern testing equipment for troubleshooting and efficient tune-up.
- 6226 Tune-up Shop II** **3**  
A continuation of Tune-up Shop I (6225).
- 6227 Diesel Engine Disassembly and Inspection—Corequisite: 6218** **3**  
Teaches the procedure for disassembly and inspection of diesel engines, including use of the shop manual and special tools and equipment.
- 6230 Diesel Engines II—Prerequisite: 6220** **3**  
Studies diesel engine block and related components. Includes laboratory work and engine overhaul.

**6235 Diesel Engine Theory****4**

Studies the theory of modern heavy-duty industrial diesel engines. Includes troubleshooting and use of service manuals.

**6236 Fluid Power Fundamentals****3**

Introduces fundamentals of fluid power, including principles, functions, terminology, and hydraulic and pneumatic symbols. Emphasis on hydraulic principles and equipment; development of hydraulics; advantages and problems of hydraulic setups; physical properties of liquids; operation and construction of hydraulic pumps, motors and valves; types and uses of seals, packings and tubing; and applications of hydraulic components in typical circuits and industrial equipment.

**6240 Diesel Engine Diagnosis—Prerequisite: 6230****3**

Covers the diagnosis and correction of malfunctions in domestic diesel engines. Includes hands-on practice.

**6243 Diesel Fuel Systems****4**

Introduces different types of fuel systems, including various types of combustion chambers, used in industrial and agricultural engines.

**6246 Diesel Engine Removal and Replacement****3**

Studies the removal and replacement of diesel engines in various types of heavy duty vehicles.

**6251 Failure Analysis****3**

Studies how to analyze component failure in all areas of the diesel industry.

**6252 Diesel Fuel Systems Laboratory I****4**

Provides hands-on training in parts matching, fuel pump assembly, and final testing and adjustment on calibration test stand.

**6253 Diesel Fuel Systems Lab II****4**

A continuation of Diesel Fuel Systems Lab I (6252).

**6254 Diesel Engine Upper Rebuild****3**

Demonstrates procedures for disassembly and inspection of diesel engines. Includes use of shop manuals and special tools and equipment.

**6255 Diesel Engine Lower Rebuild****3**

Covers inspection of new parts and procedures for rebuilding diesel engines. Emphasizes importance of careful measurements and adherence to specifications.

**6256 Diesel Engine Rebuild III (Reassembly and Test)****3**

Covers the final assembly of a diesel engine and procedures for testing the power output, oil pressure, and emissions.



- 6257 Diesel Component Rebuild** **3**  
 Teaches how to rebuild and check component systems, such as turbochargers, air compressors, lubrication systems, and air intake and exhaust systems
- 6258 Diesel Engine Tune-up** **4**  
 Trains the student to tune up and service a diesel engine. Covers disassembly of fuel system components, parts identification, and study of fuel flow paths. Emphasis is placed on Cummins Pressure Timing fuel systems.
- 6259 Diesel Fuel Systems II—Prerequisite: 6243** **3**  
 Studies modern fuel injection systems, with emphasis on disassembly, inspection, and reassembly of components. Attention given also to diesel combustion requirements and thermal efficiency on two- and four-stroke-cycle diesel engines
- 6260 Diesel Fuel Pump Calibration—Prerequisite: 6243, 6259** **3**  
 Covers diagnosis, repair, overhaul, and testing of diesel fuel systems and components. Includes final testing and test stand calibration adjustments.
- 6261 Heavy Duty Clutches and Manual Transmissions** **3**  
 Studies the design, function, theory of operation, diagnosis, repair, and testing of heavy duty clutches and manual transmissions.
- 6262 Heavy Duty Drive Lines and Rear Axle Assemblies** **3**  
 Studies the design, function, theory of operation, diagnosis, repair, and testing of heavy duty drive lines and rear axle assemblies. Emphasis placed on universal joints, drive shafts, differentials, and rear axle assemblies.
- 6263 Heavy Duty Brake Systems—Prerequisite: 6236** **3**  
 Studies heavy duty brake systems, with emphasis on diagnosis, repair, testing, and service of air brake systems and components.
- 6264 Heavy Duty Chassis, Suspension, and Steering** **3**  
 Studies heavy duty truck frame designs and suspension components, with emphasis on diagnosis, repair, and testing. Includes king pins, front axles, tie rods, springs, shock absorbers, and alignment of wheels and frame.
- 6265 Heavy Duty Automatic Transmission - Theory and Design** **3**  
 Studies automatic transmissions used in medium and heavy duty trucks. Covers design, construction, function, and operating principles, with emphasis on power flow within the transmission.
- 6267 Heavy Duty Automatic Transmission - Bench Overhaul I** **3**  
 Studies bench overhaul of basic automatic transmissions and components used in medium and heavy duty trucks. Demonstrates how to determine if components and systems are within tolerance limits and to restore units to manufacturers' specifications.

**6268 Heavy Duty Automatic Transmissions - Bench Overhaul II****3**

Covers bench overhaul of more sophisticated automatic transmissions and components used in medium and heavy duty trucks. Demonstrates how to determine if components and systems are within tolerance limits and to restore units to manufacturers' specifications.

**6269 Advanced Fluid Power—Prerequisite: 6236****3**

Covers advanced principles and functions of fluid power and the terminology and symbols for hydraulics and pneumatics. Emphasis placed on systems design, fabrication, diagnosis, repair, maintenance, and testing.

**6270 Mobile Air Conditioning & Refrigeration—Theory****3**

and Service Studies the theory of operation, function of components, and normal minor maintenance of commercial air conditioning units.

**6271 Mobile Air Conditioning & Refrigeration—Diagnosis and Repair****3**

Covers diagnosis of mobile commercial air conditioning malfunctions and the repair, replacement, and overhaul of various components.

**6310 Laundry Equipment Applications****8**

Instructs in the diagnosis of malfunctions and the servicing of commercial and domestic electrical laundry appliances (washer and dryer units).

**6311 Customer Relations****1**

Develops the skills needed to deal successfully with customers.

**6409 Basic AC/DC Circuits Laboratory****2**

Provides laboratory experiments to augment Basic AC/DC Circuits (6410).

**6410 Basic AC/DC Circuits****4**

Surveys electrical laws and principles pertaining to DC and AC circuits. Discusses current, voltage, resistance, power, inductance, capacitance, and transformers.

**6411 Basic Electronics****4**

Surveys the principles of semiconductor devices and their application to electronic circuits. Topics include diodes, bipolar junction transistors, field effect transistors, amplifiers, oscillators, and power supply circuits.

**6412 DC Fundamentals I****3**

Studies applications of the electrical laws and principles pertaining to DC circuits, voltage, current, and resistance relationships. Stresses component identification and use of lab test equipment.

**6413 Fabrication****3**

Provides practical experience in techniques of electronic construction, fabrication, and assembly. Emphasis placed on the use and care of shop tools and test equipment.

- 6414 DC Fundamentals II** **3**  
Continues DC Fundamentals I (6412), with introduction to inductance and capacitance.
- 6415 Basic Electronics Laboratory** **2**  
Supplements Basic Electronics (6411).
- 6420 Introduction to Data Processing and Computers** **3**  
Includes an overview of computer technology and data processing and study of specific electronic components and circuitry.
- 6423 AC Fundamentals I** **3**  
Introduces the principles of AC circuits, with emphasis on impedance and phase relationships.
- 6424 Troubleshooting Techniques—Prerequisite: Introduction to Test Equipment (6424) or advisor's approval** **3**  
Studies techniques of troubleshooting electronic circuits and simple systems. Emphasis placed on systematic diagnostic methods. Provides further experience in the use of shop test equipment.
- 6425 AC Fundamentals II** **3**  
A continuation of AC Fundamentals I (6423), with emphasis on resonant and AC filter circuits.
- 6426 Electronics Drafting** **3**  
Studies the techniques used in diagramming electronics circuits and systems, with emphasis on drawing, reading, and interpreting diagrams and electrical blueprints.
- 6434 Introduction to Active Devices** **3**  
Introduces structure and operating principles of vacuum tube and transistor devices.
- 6435 Electronics Circuits I** **3**  
Studies use of active and passive components in power supply, oscillator, and amplifier circuits.
- 6436 AM Radio** **3**  
Studies AM receiver principles and circuits, with emphasis on amplitude modulation and demodulation.
- 6438 FM Radio** **3**  
Studies FM receiver principles and circuits, with emphasis on frequency modulation, demodulation, and multiplex.

- 6440 CET Preparation** **2**  
 Prepares students for certification as electronics technicians
- 6441 FCC 3rd and 2nd Class License** **4**  
 Prepares students through concentrated study to meet FCC 3rd and 2nd Class licensing standards
- 6443 Indiana State Radio and Television License** **4**  
 Prepares students to meet state licensing requirements.
- 6444 Advanced Radio Circuits** **3**  
 Studies principles and circuits of FM stereo multiplexing, tape players, and CB transceivers, with emphasis on the function and operation of IC components used in radio systems. Laboratory experience includes alignment and troubleshooting of AM, FM, FM Stereo, tape players, and CB radios
- 6445 Monochrome Television** **3**  
 Studies television circuitry, with emphasis on the principles of cathode ray tubes, scanning and synchronizing methods, and video amplification. Includes principles of antennas and transmission lines
- 6446 Integrated Circuits** **3**  
 Introduces various classifications and categories of linear and digital integrated circuits.
- 6447 Special Semiconductors** **3**  
 Introduces theory and operation of semiconductor devices other than bipolar transistors. Includes optoelectronic components, FETs, and other special semiconductor devices
- 6448 Color Television** **3**  
 Studies principles and circuits of the specialized systems used in color television receivers, emphasizing similarities and differences in color and monochrome systems.
- 6449 Closed Circuit Television** **3**  
 Studies principles of closed circuit TV, with emphasis on closed circuit TV camera operations
- 6450 Television Troubleshooting** **3**  
 Develops advanced skills in diagnostic procedures, with emphasis on service, installation, and adjustment of color and solid-state TV receivers.
- 6451 Communications Electronics I** **3**  
 Includes study of AM, FM, pulse, SSB, and other modulation systems. Also presents basics of facsimile systems.

- 6452 Communications Electronics II** **3**  
Offers further study of 2-way communication equipment, including the installation, maintenance and troubleshooting of commercial and CB systems.
- 6453 Communications Electronics III** **3**  
Studies the operation and maintenance of commercial AM, FM, and television broadcast equipment and antennas. Includes study of link transmitters.
- 6454 Electronics Circuits II** **3**  
A continuation of Electronic Circuits I (6435). Emphasis on pulse and logic circuit fundamentals, including waveforms of the nonsinusoidal variety frequently used in pulse and logic circuits.
- 6455 Circuit Analysis** **3**  
Presents circuits and systems analysis, using equivalent circuit principles and theorems.
- 6456 Advanced Troubleshooting** **3**  
Presents troubleshooting procedures and techniques for transmitters and receivers.
- 6457 Electromechanical Controls** **3**  
Studies basic electromechanical control systems related to industrial electronics, including basic and pilot control devices. Includes circuit layout, industrial schematics, reduced voltage starters, and multispeed controllers.
- 6458 Magnetic Recording** **3**  
Studies principles, maintenance, alignment, and operation of magnetic recording equipment.
- 6459 Business Practices** **2**  
Studies general business practices associated with the operation of technical service enterprises.
- 6460 Microwave and Radar** **3**  
Studies microwave generators, waveguides, relay systems, and components, including klystrons, magnetrons, gas diodes, and their applications.
- 6461 Antennas and Wave Propagation** **3**  
Studies receiving and transmitting antenna and arrays, transmission lines, wave guides, and coupling circuits.
- 6462 Audio Electronics** **1**  
Offers detailed and practical study of audio systems for home and commercial use. Includes study of pick-ups, amplifiers and speakers.

**6463 Linear Integrated Circuit Timers** 3

Trains students in the use of linear integrated circuits to obtain digital astable and monostable operations.

**6464 Phase-locked Loop** 3

Introduces the elements composing the phase-locked loop. Focuses on applications of the phase-locked loop to the reception of communication signals.

**6465 Active Filters** 3

Studies low-pass, high-pass, band-pass, and notch filters using operational amplifiers. Focuses on the design of multiple pole filters and the characteristics of Butterworth and Chebyshev filters.

**6470 AC Fundamentals** 6

Introduces principles of AC circuits, with emphasis on impedance and phase relationships. Also introduces inductance, capacitance, resonance, and transformers.

**6471 DC Fundamentals** 6

Studies applications of the laws and principles pertaining to DC circuits, voltage, current, and resistance relationships. Stresses component identification and use of lab test equipment.

**6485 Telecommunication Principles** 4

Analyzes modems and data transmission systems, with attention to optimum speed of transmission and line conditioning requirements to reduce the rate of error in remote transmission of digital data. Also examines commonly used peripheral devices and interfaces with remote terminals.

**6501 Data Processing Machine Theory and Repair** 4

Studies the characteristics, applications, maintenance, troubleshooting, and repair of peripherals used with computer systems. Covers devices used for loading and unloading, bulk storage, display, and interaction. Examines the methods and magnitude of I/O interfacing problems.

**6502 Digital Troubleshooting** 4

Studies techniques of logical troubleshooting of digital circuits. Includes the interpretation of schematic diagrams for both combinational and sequential logic circuits. Also covers the isolation of faults to the piece part level and introduces high speed test equipment commonly used to locate faults.

**6520 Microprocessors I** 3

Introduces microprocessors, including the architecture of a typical processor. Includes a review of number systems, codes, and computer arithmetic. Introduces addressing modes, programming model, and instruction set.

**6521 Microprocessor Applications** 3

Continues Microprocessors I (6520), emphasizing the application and interfacing

of microprocessor systems. Covers hardware specifications of the principal system components, such as CPU, memory, and I/O interfacing.

### **6524 Troubleshooting Techniques 3**

Studies techniques of logical troubleshooting of electronic circuits and simple systems, with emphasis on signal tracing and signal injection methods. Includes communications skills.

### **6525 Introduction to Test Equipment 3**

Introduces the use of lab and shop testing equipment in troubleshooting.

### **6527 Peripherals I 3**

Studies peripherals commonly used with typical small machines such as keyboards, LED displays, cassette recorders, Tarbell, and teletype.

### **6530 Test Equipment Maintenance 3**

Studies the repair and calibration of electronic test equipment, including VOMs, VTVMs, signal generators, and oscilloscopes. Includes study and use of test equipment standards.

### **6531 Independent Study 1-3**

Offers opportunity for independent study in an area related to the student's major program. For approval the study must follow a prescribed scientific method. Evaluation is based on a submitted written report.

### **6533 Microprocessors II 3**

Continues the study of microprocessors, including the support devices family and interfacing with simple I/O devices. Includes study of monitor programs, memory, and machine language programming.

### **6534 Industrial Interfaces 3**

Studies how to design circuits to interface microprocessors with analog equipment. Also studies the conversion of energy produced by pressure, force, position, and temperature into electrical voltage or current compatible with the microprocessing system.

### **6535 Peripherals II 3**

A continuation of Peripherals I (6527), including study of credit card readers, CRT displays, and paper-tape and floppy disk devices. Includes study of each device and the interfacing with typical small machine I/O port devices.

### **6536 Programming 3**

Reviews machine language and flow charting and proceeds with symbolic, basic, and assembly language. Also includes a study of editors.

### **6538 Rotating Machines I 3**

Introduces common industrial rotating machines, both single and polyphase.

**6539 Rotating Machines II****3**

A continuation of Rotating Machines I (6538), with emphasis on power distribution.

**6540 Medical Electronics I—Prerequisite: Approved physiologic course from Health Occupations program.****3**

Introduces bioelectrical potentials, including blood flow and pressure, respiration, and cardiac output, with emphasis on conversion and measurement of these physiological signals.

**6541 Medical Electronics II****3**

Continues study of medical electronics equipment, including ECG, EKG, EEG, detibrillators, heart monitors, and other monitoring equipment.

**6542 Medical Electronics III****3**

Studies medical support systems, including X-ray equipment, respiration, and analyzers, and their maintenance. Prepares for licensing and certification.

**6543 Basic Industrial Electronics****3**

Studies the characteristics and applications of various transducers.

**6544 Introduction to Industrial Controls****3**

Studies power switching and controlling devices including, thyristors and thyatrons.

**6545 Solid State Motor Controls****3**

Includes a review of Ohm's Law, capacities reactance, inductive reactance, electronic symbols, and single- and three-phase power. Also covers various solid state linear and static devices and their applications in polyphase systems. Introduces transient suppression, opto isolators, electromechanical relays, and solid-state relays in industrial systems.

**6546 Electrical Maintenance****3**

Focuses on the development of electrical maintenance programs for typical industrial and commercial situations. Demonstrates the use of motors and testing equipment in preventive maintenance and troubleshooting. Emphasizes protection of life, property, and production through effective use of testing equipment.

**6547 Linear Integrated Circuits Application****3**

A continuation of Integrated Circuits (6446). Emphasizes circuit applications of linear ICs, including op amps, voltage regulators, and other special analog circuits.

**6548 Programming Examples****3**

Provides extensive programming opportunities in business and home applications and games. Offers experience with up-to-date machines with suitable peripherals.



- 6549 National Electrical Code** **2**  
Covers national and local electrical codes for wiring and apparatus, methods and materials, wiring design and protection, equipment and hardware, and use of tables and diagrams for solving practical wiring problems.
- 6550 Electromechanical Controls** **3**  
Studies electromechanical control systems pertaining to industrial electronics. Includes basic and pilot control devices, such as circuit layout, industrial schematics, voltage starters, and multispeed controllers.
- 6551 DC Fundamentals III** **3**  
A continuation of DC Fundamentals II (6414), with emphasis on super-position and the Venin and Nortan Theorems.
- 6552 AC Fundamentals III** **3**  
A continuation of AC Fundamentals II (6425), with emphasis on vacuum tube theory and circuits.
- 6553 Industrial Electronics I** **3**  
A continuation of Introduction to Industrial Controls (6544), with emphasis on systems and circuits.
- 6554 Industrial Electronics II** **3**  
Studies process controls and service systems.
- 6555 Medical Electronics and Safety** **3**  
Studies Medical Electronics, with emphasis on the applications of electronics and electronic devices to medicine; includes study of electrical safety and care and use of electronic equipment.
- 6562 Digital Principles I** **3**  
Introduces combinational logic through use of Boolean algebraic expression.
- 6563 Digital Principles II** **3**  
A continuation of Digital Principles I (6562), with emphasis on counters, clocks, registers, and arithmetic circuits.
- 6574 Advanced Electromechanical Controls** **3**  
Studies advanced electromechanical control systems pertaining to industrial electronics.
- 6577 Digital Principles III** **3**  
Offers advanced study of digital systems, including memory and D/A and A/D conversion. Covers construction of specified timing, circuits, and design driver/display systems; design of selected register, counters, and arithmetic circuit; and validation of operation.

**6578 Digital Applications****3**

Studies interfacing fuses of various digital devices, circuits, and systems; development of programs in machine language; and demonstration of digital systems for specified operations.

**6583 Electrical Safety for Hospitals****4**

Studies the electrical safety regulations as established in the Accreditation Manual for Hospitals and the National Electrical Code. Continues study of electrical wiring and equipment calibration.

**7112 Heating Fundamentals****3**

Studies fundamentals of the heating phase of air conditioning, including types of units, parts, functions, and applications. Attention also given to the combustion process, heat flow, temperature measurements, and basic control devices.

**7113 Basic Electricity for Air Conditioning****3**

Covers basic electricity, including theory of current flow, Ohm's Law, current voltage and resistance measurements, and use of electrical measuring instruments. Also includes switching circuits; magnetism; transformers; fusing and wire sizing; series, parallel and combination circuits; and an introduction to pictorial and schematic wiring diagrams.

**7114 Basic Mechanics and Shop Techniques****3**

Introduces safe and efficient use of tools and torches in the installation of copper tubing and copper and steel piping. Instructs in the use of soldering, brazing, and oxyacetylene gas welding apparatus in connection with specific materials.

**7115 Basic Electricity for Air Conditioning—Practicum****1**

Supplements Basic Electricity for Air Conditioning (7113).

**7123 Air Conditioning and Refrigeration Fundamentals****3**

Studies the compression system used in mechanical refrigeration and air conditioning. Covers refrigeration cycle, compressors, receivers, evaporators, condensers, metering devices, and refrigerants. Also includes temperature conversions, absolute temperature, and gas laws. Introduces basic mechanical service procedures used throughout the industry.

**7124 Heating Service (Gas and Oil)****3**

Deals with gas and oil heating units for residential use. Demonstrates analytical methods for solving mechanical and electrical equipment problems. Attention given to pictorial and schematic diagrams.

**7125 Motors and Motor Control****3**

Covers various types of motors, including single-phase capacitor start, capacitor start and run, shaded pole, tap wound, and 3-phase. Demonstrates how to select the proper motor for a specific application and how to diagnose motor problems. Emphasis on motor control and protective devices.

- 7126 Air Conditioning and Refrigeration** **3**
- A continuation of Air Conditioning and Refrigeration Fundamentals (7123), covering compressors, condensers, receivers, metering devices, evaporators, and other system components. Continues study of mechanical service procedures used throughout the industry.
- 7127 Heating Service—Electrical & Hydronic** **3**
- Studies electric and hydronic heating systems for residential use and the methods used to analyze electrical and mechanical problems. Includes study of control systems and pictorial and schematic diagrams.
- 7130 Home Heating and Cooling Systems Service** **3**
- Course is designed for the home owner who desires a basic knowledge of residential environmental heating and air conditioning equipment. Emphasis placed on annual servicing, cleaning, and minor troubleshooting.
- 7133 Cooling Service—Electrical** **3**
- Covers service procedures for residential air conditioning systems and low voltage (24 volts) control wiring. Emphasis on schematic and pictorial wiring diagrams.
- 7134 Cooling Service—Mechanical** **3**
- A continuation of Cooling Service—Electrical (7133). Covers troubleshooting, procedures for cleaning a system following compressor burnout, suction and liquid line filters, and strainer-dehydrators.
- 7135 Electrical Circuits and Controls** **3**
- Covers electrical, gas, oil, cooling, and system controls. Studies the operation of individual controls and the integration of those controls into control systems.
- 7136 Psychrometrics** **3**
- Covers methods of estimating heat loss and gain in commercial and industrial work. Introduces use of the psychrometric chart in calculating air qualities and quantities. Emphasis placed on selection of equipment and on coil, blower, and duct sizing. Includes study of ventilation systems.
- 7137 Heat Loss and Gain Calculations** **3**
- Covers methods of calculating heat loss and gain in the sizing of units for residential application. Attention given to methods of reducing energy consumption in residences.
- 7143 Blueprint Reading** **3**
- Studies the reading of blueprints relevant to the heating and cooling trade. Covers floor plans, elevations, sections, details, plot plans, and mechanical plans. Demonstrates how to make tracings of blueprints and layouts of air conditioning systems. Also covers the use of symbols, notations, and schedules on drawings. Emphasis placed on lettering techniques and neatness and clarity in drafting.

**7144 Commercial Refrigeration****3**

Studies light commercial air conditioning and refrigeration systems, including medium and low temperature applications. Covers refrigeration accessories, metering devices, and mechanical and electrical controls. Introduces electrical and hot gas defrost systems.

**7145 Heat Pump Service****3**

Studies heat pumps used in residential applications. Covers types of systems, system control, balance points, C.O.P. ratings, and pictorial and schematic diagrams.

**7146 Advanced Cooling Service****3**

Covers methods of troubleshooting the electrical and mechanical components of central air conditioning systems.

**7147 Uniform Mechanical Codes****2**

Studies state and local codes and ordinances covering the erection, installation, alteration, repair, relocation, replacement, addition to, use of, and maintenance of heating, ventilating, cooling and refrigeration systems and their components.

**7152 Air Balancing****3**

Studies the measurement of air flow in heating, air conditioning, ventilating, and exhaust systems and the adjustment of fan speeds, dampers, and other air regulating devices. Attention given to air velocities, noise control, and effects of duct sizing on fan brake horsepower. Students will prepare air balance reports.

**7153 Advanced Commercial Refrigeration****3**

A continuation of Commercial Refrigeration (7144), including work with heavy commercial equipment. Covers metering devices, accessories, and advanced control arrangements. Stresses trouble diagnosis and safety precautions in dealing with refrigerants and heavy equipment.

**7154 Duct Fabrication and Installation****3**

Studies layout and fabrication of ducts and fittings. Covers use of sheet metal hand tools and shop equipment.

**7155 Specifications and Estimating****3**

Studies use of job and equipment specifications, blueprints and engineering data to "take-off" a job and determine the costs of materials, labor, and equipment. Covers overhead, job-related costs, labor costs plus fringes, warranty coverages, taxes, permits, subcontracts, mark-ups and margins, and estimating of service and maintenance contracts.

**7156 Energy Management and Balancing****3**

Studies energy consumption (electricity, steam, gas, oil, coal) in buildings and methods of decreasing operational costs. Covers construction and insulation of systems, zoning and control, programmed night and offtime setback, control of exhaust fans and make-up air units, control of heating and air conditioning systems, types of

heat reclamation units, and energy-saving exhaust hoods. Also covers overall energy control layouts and retrofitting of existing heating and air conditioning systems.

### **7157 Alternative Energy Fundamentals 3**

Studies the magnitude of energy available from the sun, the various methods of collecting it, and the use and storage of energy for heating and cooling. Covers space heating and cooling, domestic and commercial hot water heating, and the heating of swimming pools. Students will design air and water systems and controls and determine the operational costs and savings.

### **7158 Absorption Air Condition Systems 3**

Studies absorption cycle as used in cooling work. Covers ammonia-water and lithium-bromide cycles, types of units, arrangements, parts, functions, and applications of units in air conditioning systems. Includes diagnosis of service problems

### **7160 Duct Fabrication and Installation—Practicum 1**

Develops skills in layout and ductwork measurement and use of sheet metal hand tools and shop equipment. Provides experience in working with sheet metal and fiberglass duct board.

### **7162 Specialized Environmental Systems I 3**

Covers specialized environmental systems, including heat pumps of all types, and solar, electrohydraulic, heat conservation, heat recovery, and temperature and humidity control systems.

### **7163 Air Distribution System Design 3**

Demonstrates methods used to size duct work for residential applications. Students will make working drawings of various types of duct systems.

### **7164 Specialized Environmental Systems II 3**

A continuation of Specialized Environmental Systems I (7162), with reference to pneumatic and other control systems.

### **7165 Advanced Electrical Controls 3**

Studies more complex control systems than those found in the average residential or single-zone commercial installation. Includes electronic and solid-state controls, zoning control, modulating controls used in larger systems, refrigerant flow, low-ambient controls, heat recovery, and economizer control arrangements.

### **7167 Air Distribution System Design—Practicum 1**

Offers opportunity for further skill development in designing, sizing, and balancing of air distribution systems and in selecting of equipment to meet design needs.

### **7168 Advanced Alternative Energy 3**

Studies solar, geothermal, photovoltaic and sea energies, wind power, methane, alcohol, and the recycling of wastes. Also covers the design and control of energy systems.

**7169 Advanced Electrical/Electronics Control System II****3**

Continuation of Advanced Electrical Controls (7165).

**7174 Service Organization and Management****3**

Studies the operation of a service department, including taking service calls and dispatching servicemen, personnel recruitment and training, truck maintenance, stocking and routing of trucks, handling of service tickets, pricing procedures, collection practices, warranty parts and procedures, service department overhead, customer relations, advertising costs, and service contracts.

**7175 Equipment Sales****3**

Studies sales engineering as a profession. Covers sales techniques and procedures, the role of manufacturers' representatives, marketing through written quotations and proposals, the formulation and writing of service contracts, and compensation plans for salesmen.

**7176 Applied Design****4**

Studies complete air conditioning systems through analysis of a given job, including calculation of heat losses and gains, selection of equipment and layout distribution systems, preparation of working drawings, and determination of operating and maintenance costs. Covers design and sizing of refrigerant piping, cooling tower piping, and chilled water-hot water piping.

**7180 Basic Residential Electrical Wiring****3**

Introduces basics of residential wiring and circuitry, with special emphasis on service entrance requirements for all types of heating and air conditioning equipment.

**7181 Advanced Residential Electrical Wiring****3**

Focuses on upgrading and problem solving in installations of heating and air conditioning equipment, repair and/or improvement of existing systems, and new installations in new or existing structures.

**7331 Industrial Machine Electrical Circuits****3**

Studies fundamental single- and 3-phase alternating current, including parallel circuits, resistance, inductance, switching, fusing, current requirements, transformer applications, and motor control as applied to typical machinery diagrams. Includes discussion of design, wiring techniques, and fabrication of wiring for machines.

**7339 Machine Diagnosis and Repair—Electrical****3**

Studies troubleshooting of electrical control circuits, with emphasis on quick location of defective circuit section and component. Covers relays, heaters, motor control switches, and timers.

**7340 Machine Diagnosis and Repair—Mechanical****3**

Develops skills required in the production of new and reconditioned mechanical parts for machines under repair. Presents techniques for calibration and repair of electromechanical devices and practice in computations pertaining to industrial machinery.

Also includes techniques related to gearing and use of lead-screws, ways, couplings, bearings, dovetails, and clutches, with emphasis on safety.

### **7341 Basic Hydraulic and Pneumatic Principles 3**

Covers principles and functions of fluid power and components. Includes study of terminology and the use and repair of equipment.

### **7342 Hydraulic and Pneumatic Systems and Repair—Prerequisite: 7341 3**

Studies hydraulic and pneumatic systems design and the proper use of tools in repairing and troubleshooting hydraulic and pneumatic systems. Covers hydraulic and pneumatic valves, oils, gauges, fittings, hoses, and other components.

### **7343 Preventive Maintenance 3**

Stresses the importance of preventive maintenance for industrial equipment. Covers lubrication, maintenance procedures, and inspection records. Studies the effects of temperature, moisture, and corrosion on stored parts and the effects of speeds, feeds, machine loads, and gearing on machine performance.

### **7344 Power Plant Mechanics I 3**

Offers advanced study in power plant mechanics for qualified students.

### **7345 Power Plant Mechanics II 3**

Continuation of Power Plant Mechanics I (7344).

### **7346 Industrial Instrumentation I 3**

Explains the purpose, function, and application of industrial instrumentation systems. Covers temperature and pressure measurement, flow meters, controllers, transmitters, regulators, and quality control.

### **7347 Industrial Instrumentation II—Prerequisite: 7346 3**

A continuation of Industrial Instrumentation I (7346).

### **7348 Millwright I 4**

Introduces hand and power tools and measuring instruments used in carpentry, blacksmithing, rigging and equipment, machine, and general shop work.

### **7349 Millwright Laboratory I 3**

Develops proficiency in the use of the trade tools and measuring instruments introduced in Millwright I (7348) through work assignments on general shop, machinist, carpentry, blacksmithing, rigging, and equipment installation projects.

### **7350 Millwright II—Prerequisites: 7348 and 7349 4**

Introduces machinery and related equipment, including drive components, bearings, pumps, packing and seals, turbines, air compressors, boilers, mechanical fasteners, and the selection and use of lubricants.

- 7351 Millwright Laboratory II** **3**  
 Applies mechanical principles to the assembly and disassembly of mechanical equipment, including drive components, bearings, pumps, packing and seals, air compressors, turbines, and other auxiliary equipment. Emphasizes use of maintenance manuals.
- 7352 Troubleshooting Skills** **3**  
 Introduces systematic and logical approaches to troubleshooting. Demonstrates procedures for both scheduled and unscheduled maintenance.
- 7353 Cleaning Maintenance** **3**  
 Instructs in the selection and use of cleaning materials and equipment, sanitation procedures, and safety practices for the maintenance of buildings.
- 7355 Industrial Maintenance—Prerequisites: 7348, 7349, and 7350** **2**  
 Applies the mechanical principles of disassembly and assembly of mechanical equipment, including drive components, bearings, pumps, packing and seals, air compressors, turbines, and related auxiliary equipment. Emphasis placed on the interpretation of maintenance manuals.
- 7356 Millwright Laboratory III** **2**  
 A continuation of Millwright Laboratory II (7351).
- 7357 Millwright Laboratory IV** **2**  
 A continuation of Millwright Laboratory III (7356).
- 7358 Power Plant Maintenance I** **3**  
 Introduces power plant fundamentals, including hand tools, portable power tools, stationary shop equipment, basic oxyacetylene processes, rigging and lifting, lubrication, measurements, blueprint reading, preventive maintenance, caution and hold card procedures, dismantling and reassembly, cleaning, and painting. Emphasis placed on safe use of equipment.
- 7359 Power Plant Maintenance II** **3**  
 A continuation of (7358) Power Plant Maintenance I.
- 7380 Advanced Hydraulics** **6**  
 Studies hydraulic pumps, actuators, and components, with emphasis on troubleshooting, service, and repair.
- 7381 Equipment Installation and Rigging** **3**  
 Demonstrates procedures for leveling and aligning equipment and methods and tools for moving equipment of various sizes and shapes. Includes formulas for calculating mechanical advantages and safe working loads for ropes, blocks and tackles, and slings. Also demonstrates use of ladders, scaffolds, safety belts, and life nets for use in maintenance work at various heights.



- 7382 Piping Systems** **2**  
 Studies the construction, components, and uses of piping systems, with attention to the characteristics of piping materials and the behavior of fluids in a line. Emphasis placed on the maintenance of piping systems.
- 7383 Lubrication** **2**  
 Defines lubricants and presents principles and practices of lubrication. Stresses the effectiveness of lubrication in reducing equipment downtime and repair.
- 7384 Bearings** **3**  
 Studies procedures for the removal, repair, and installation of bearings. Emphasis placed on preventive maintenance.
- 7385 Drive Components** **3**  
 Studies the uses, functions, construction, and operation of drive components. Demonstrates methods of installation, lubrication practices, and maintenance procedures.
- 7386 Air Compressors** **3**  
 Studies pneumatic (compressed air) principles and systems. Examines how pneumatic power is produced, used, and controlled.
- 7387 Pumps** **3**  
 Studies the construction and operation of centrifugal, reciprocating, and rotary pumps and their components. Includes procedures for troubleshooting, installation, and maintenance.
- 7390 Instrumentation Calibration** **3**  
 Studies manufacturers' techniques for calibrating electronics and pneumatic transmitters, controllers, recording valves, and valve positioners. Includes tear-down, assembly, alignment, and calibration of equipment.
- 7391 Measurements and Calibrations** **3**  
 Studies electronic test instruments and how to use them, accuracy and limitation of measurement, and calibration methods in accordance with ASA and API standards.
- 7392 Flow Measurements and Calibrations** **3**  
 Studies practical methods of flow measurement and integration, stressing orifice selection and calculation methods in accordance with ASA and API standards.
- 7510 Basic Drafting** **3**  
 Introduces drafting equipment, lettering techniques, sketching, basic dimensioning, scale reading, and geometric construction.
- 7511 Intermediate Drafting—Prerequisite: 7510** **3**  
 A continuation of Basic Drafting (7510). Presents isometric, oblique, and perspec-

tive projection techniques, auxiliary views, sections, and precision dimensioning and tolerance.

**7520 Descriptive Geometry—Prerequisite: 7510** **3**

Studies graphic solution of engineering problems, such as true length, piercing points of a plane, line intersections, revolutions, and developments.

**7521 Industrial Processes and Systems** **3**

Studies manufacturing processes and equipment selection, use of modern machine tools, methods of fabrication, welding, electroforming, metallic coating, anodizing, plating, machine tool numerical control, and hydraulic systems as used in industry.

**7522 Production Drawing—Prerequisite: 7511** **3**

Studies working drawings, detail and assembly drawings, use of handbook data, developments, and intersections, with emphasis on thread fasteners, springs, and weldments.

**7523 Introduction to Dimensioning** **4**

Introduces dimensioning fundamentals and practices, with attention to size, location, and placement. Emphasis placed on dimensioning notation.

**7525 Introduction to Printed Circuit Design** **3**

Introduces electrical and electronic terms and applications, schematic diagrams, board layout of components, manufacture of printed circuit boards, and art master tape-up operations.

**7528 Introductory Drafting for Heating and Air Conditioning—Prerequisite: 7143** **3**

Studies lettering, linework, isometric drawing, and layout of ducts, electrical controls, and pipes.

**7529 Introductory Drafting for Machine Tool** **3**

Studies lettering, isometric drawing, orthographic projection, sectioning, dimensioning, and numerical control.

**7530 Produce Drafting I—Prerequisite: 7521 & 7522** **3**

Studies detail and assembly drawings, stock lists, springs, weldments, and catalog items.

**7531 Mechanisms and Machines—Prerequisites: 7511, 8209, 8301** **3**

Studies machines and their elements, including shafts, bearings, keys, pins, springs, clutches, brakes, and pressure cylinders, in a simulated industrial environment. Includes study of displacement velocity and acceleration, the geometry of involute gears, and the properties of standard spurs and helical, bevel, and planetary gears. Also includes analysis of linkages, cams, and gears.

**7532 Tool Drafting—Prerequisite: 7521 & 7522 3**

Studies the detailing of metal cutting tools, jigs, fixtures, gauges, and other tools used in manufacturing processes.

**7533 Die Design—Prerequisite: 7521 & 7522 3**

Studies the planning and detailing of blank, piercing, and forming dies. Attention given also to plastic mold and die casting.

**7540 Product Design Drafting—Prerequisite: 7520 & 7530 3**

Studies the design of consumer products, with attention to function, sales appeal, and cost.

**7541 Advanced Tool and Gauge Design Drafting 3**

Studies the design of jigs, fixtures, cutting tools, tool holders, and gauges for an existing product, with attention to standards and former designs.

**7543 Technical Illustration 3**

Introduces three-dimensional drawing methods and rendering techniques, with emphasis on the use of templates. Also presents isometric drawing, measuring in isometric, line, and plane positions, and use of reference lines and points.

**7545 Product Drafting II 3**

Studies the development, design, and manufacturing of consumable and depreciable items, with special attention given to the use of standard catalog sizes and equipment.

**7547 Electronic Drafting 3**

Studies the diagramming of electronic circuits and systems, with emphasis on drawing and interpretation of diagrams and electrical blueprints.

**7548 Basic Geometric Dimensioning and Tolerancing—Prerequisite: 7522 & 7523 3**

Introduces principles and techniques of geometric dimensioning and tolerancing (GDT). Attention given to engineering, design, drawing, specifications, function, and interrelationship of parts.

**7550 Gear and Cam Design Drafting—Prerequisite: 7522 3**

Studies cam design and principles governing the conversion of rotary motion into linear. Includes detailed study of types and functions of gears, power transmission and speed, and mechanical advantage.

**7551 Statics—Prerequisite: 8209 & 8302 3**

Covers theory and applications of engineering mechanics; fundamental quantities, units, force, and position vectors; equilibrium of a particle; equivalent force systems; equilibrium of a rigid body; structural analysis; internal forces; center of gravity and centroids; moment of inertia for an area; radius of gyration; and section modules.

- 7552 Strength of Materials—Prerequisite: 7551** **3**  
 Covers various types of stresses and strains, modules of elasticity, shear and bending diagrams, bending and deflection, and safe loading capacities of structural members under working loads.
- 7553 Advanced Die Design Drafting—Prerequisite: 7533** **3**  
 Studies the design and drafting of piercing and forming dies, using standards and handbook data. Includes procedures for blanking, progressive, compound, piece-part-form-bend, and draw dies.
- 7554 Product Drafting - Team Project** **3**  
 Introduces the "team" approach frequently utilized by large drafting departments in dealing with complex, multifaceted projects.
- 7555 Mold Design Drafting—Prerequisite: 7522** **3**  
 Studies the design and construction of molds commonly used in mass production, with attention given to product shape.
- 7556 Cutting Tool Design Drafting—Prerequisite: 7521 & 7522** **3**  
 Deals with the design of single- and multiple-point cutting tools. Includes metallurgy as it relates to the design and use of metal-cutting tools.
- 7557 Jig and Fixture Design—Prerequisite: 7511 and 7522** **3**  
 Studies the design of jigs and fixtures commonly used in industry, with attention to assembly detailing procedures. Covers theory of gauging; terminology, including ring, snap, flush, pin, thread, indicator, and location gauges; and dimensioning and tolerancing of gauges.
- 7558 Sheet Metal Drafting Project** **3**  
 Studies fundamentals of sheet metal work as applied to design and layout of sheet metal forms. Discusses layout problems in duct work design.
- 7559 Route Surveying** **4**  
 Studies theories and problems of route surveying, including horizontal and vertical curve, data, and design; highway and railroad layouts, and superelevation and earthwork calculations.
- 7560 Machine Design Drafting—Prerequisite: 8209 & 7552** **3**  
 Studies the design of automated machines and production tools actuated and controlled by hydraulics and pneumatics.
- 7561 Advanced Surveying Field Problems—Prerequisite: 7559** **3**  
 Offers field exercise in route surveying, including curve layout, setting elevations, horizontal and vertical controls, and earthwork data.
- 7562 Advanced Mold Design—Prerequisite: 7555** **3**  
 Introduces plastics and plastics manufacturing processes, with emphasis on

design of plastics for industry. Special attention given to injection, transfer, compression, and extrusion molding.

**7563 Advanced Jig and Fixture Design Drafting—Prerequisite: 7557** **3**

Studies design of various types of jigs and fixtures, with emphasis on theory of locating and clamping parts for machining.

**7564 Metallurgy—Practicum** **1**

Presents fundamentals of metallurgy, including heat treat color spectrum, grain growth, and recrystallization. Includes study of ductility and strength, preparation of testing material, and the carbon spark test. Attention given to the isothermic transformation diagram of carbon steel and the use of S.A.E. and A.I.S.I. code standards.

**7565 Metallurgy Fundamentals—Prerequisite: 7521** **2**

Studies fundamentals of thermodynamics and reactions occurring in metals subjected to heat-treatment. Includes chemical and physical metallurgy, classification and properties of metals, theory of alloys, heat treatment for steels, special steels and cast iron, and powder metallurgy.

**7573 Industrial Design Presentation—Prerequisite: 7511** **3**

Applies acquired skills in product drafting to the design of a new or existing consumer product. Consideration given to function, esthetics, costs, and marketability of the product.

**7574 Industrial Design Detailing—Prerequisite: 7511, 7523, 8209** **3**

A continuation of Product Drafting I (7530). The student will design, develop, and prepare a product for production, with emphasis on detailed working drawings and a final assembly drawing.

**7575 Numerical Control and Data Processing—Prerequisite: 8209** **3**

Introduces the concept of automatic process control and the fundamentals of feedback, transmission, control action, and controlling elements as used in pneumatic, hydraulic and electrical systems. Special attention given to the relationship between digital devices and the automatic process control system.

**7576 Manufacturing Planning and Estimating** **4**

Studies methods of testing and measuring value to eliminate unnecessary costs in design, development, manufacturing, engineering, and research. Gives attention to industrial engineering research, materials management, process and product control, facilities planning, plant engineering, and manufacturing information systems. Demonstrates industrial use of time and motion studies to determine rates.

**7577 Design Problems** **4**

Applies acquired knowledge and skills to the design of complete machines or subassemblies of machines.

**7578 Piping Fundamentals** **3**

Surveys residential and industrial plumbing practices and requirements.

- 7579 Basic Structures/Industrial Drafting** **3**  
Studies structural systems and the forces that act upon them. Attention given to static and dynamic loads.
- 7581 Fundamentals of Drafting** **6**  
Teaches the use and care of drafting equipment, techniques of lettering, sketching, dimensioning, scale reading, and geometric construction. Studies techniques of isometric, oblique, and perspective projections, auxiliary views, sections, and tolerances.
- 7585 Facilities Planning** **3**  
Presents factors that influence design or redesign of a facility. Emphasis placed on office and industrial plant planning.
- 7590 Computer Graphics I** **4**  
Explores the field of computer graphics, including technical graphics, orthographic multiview drawings, pictorial drawings, charts, graphs, sheet metal sketch-outs, and schematics. The student will write graphics programs and work directly with graphics input and output devices.
- 7592 Blueprint Reading for Drafting I** **4**  
Develops blueprint reading skills needed by the draftsman.
- 7610 Introduction to Mining** **5**  
Introduces the fundamentals of mining, with emphasis on management and safety. Attention given to geological factors affecting mineral formation, U.S. mineral resources, and methods of mining. Includes a tour of surface mines in the local area.
- 7611 General Physical Geology** **5**  
Studies fundamentals of geology and the geological history of North America, with emphasis on the Mississippian and Pennsylvanian periods. Includes study of sediments and sedimentary rocks, especially those allied with coal beds, and field trips in the local area.
- 7612 Surface Mining Machinery** **4**  
Studies concepts and operating principles of all types of surface mining machinery. Course includes student reports of visits to area mines, with special attention given to structural defects, safe operation, and maintenance of mines, operator training and skills, and life expectancy of workers.
- 7620 Mining Regulations** **5**  
Studies surface mine laws, including Part 77 of Federal Regulations and coal mining laws of Indiana, Illinois, and Kentucky.
- 7621 Mine Maps and Surveying** **3**  
Explains the use of mine maps and demonstrates surveying techniques applicable

to mining. Includes taping, profile leveling, cross sections, earthwork computations, and transit stadia and transit-tapes surveys.

## **7622 Mine Maps and Surveying Lab** **2**

A continuation of Mine Maps and Surveying (7621).

## **7623 Elements of Reclamation** **4**

Studies land reclamation as it pertains to the surface mining industry. Covers basics of reforestation and reviews the types of grasses and legumes found in different geographical areas. Examines existing federal and state regulations and considers future possibilities. Stresses the importance of production and reclamation as a working unit.

## **7625 Surface Mining Field Study I** **6**

Provides opportunities for field projects in surface mining, in compliance with the Cooperative Education policies defined in course listing 8501. The student's project will include data collection and analysis and actual work experience.

## **7626 Surface Mining Field Study II** **6**

A continuation of Surface Mining Field Study I (7625).

## **7630 Surface Mine Hydraulics** **4**

Presents the fundamentals of fluid power, including including function, terminology, components, and use of mining equipment.

## **7631 Elements of Soil Management** **4**

Studies the principles of soil control, with emphasis on planning, use, and management of soil materials. Includes principles of vegetative survival, deposition of overburden, and slope control.

## **7632 Equipment Operations Laboratory I** **4**

Studies practices and devices pertaining to the extraction of overburden and the transportation of coal. Attention given to equipment used in drainage and to electric, hydraulic, and compressed air power and coal preparation machinery.

## **7633 Principles of Welding** **4**

Demonstrates the use of oxyacetylene and electric arc welding equipment. Offers hands-on experience in cutting, bronze welding, fusion welding, and hard-facing with oxyacetylene flame.

## **7640 Blasting and Explosives** **5**

Instructs in the care and use of explosives, with emphasis on the mandatory standards.

## **7641 Techniques of Operation Safety and Accident Prevention** **4**

Presents information and skills useful in public relations and safety education. Develops speaking, listening, and writing skills, introduces use of the Bureau of Mines

Dictionary of Mines, instructs in the use of safety films, and reviews wage agreements, forms, and reports required by government agencies.

#### **7642 Electrical Circuits and Systems 4**

Introduces principles of electricity pertaining to machine operation. Includes conductors and conductor sizes, magnetic circuits, coil polarities, and AC and DC motors.

#### **7643 Economics of Mining and Cost Calculations 4**

Presents in everyday language the fundamentals of economics and principles of business systems. Emphasis on practical rather than theoretical economics. Includes cost and pricing, competition, money systems, taxes, and productivity.

#### **7644 Equipment Operations Laboratory II 2**

A continuation of Equipment Operations Laboratory I (7632). Offers practical experience in equipment handling.

#### **7645 Surface Mining Field Study III 6**

Provides opportunities for extended practice and skill development in specified areas of surface mining.

#### **7646 Surface Mining Field Study IV 6**

A continuation of Surface Mining Field Study III (7645).

#### **7650 Coal Preparation Plants 2**

Studies coal preparation plants, including purposes and processes, raw coal, disposal of refuse and slurry, and coal storage, loading, and mechanics.

#### **7651 Coal Sampling and Analysis 3**

Provides limited laboratory training in approved methods of coal analysis, with emphasis on the Bureau of Mines safety requirements.

#### **7652 Labor Relations 3**

Studies labor and management approaches to the operation of the mining industry. Emphasis on proper and ethical procedures.

#### **7653 Transmission Systems 4**

Studies applications of gears and gear drives and mechanical advantage in coal transportation systems, including truck, rail, slurry, and conveyor belt.

#### **7654 Mine Operational Planning 4**

Studies effective planning in day-to-day and long range mining operations.

#### **7660 First Aid and Safety Management 4**

Studies first aid, dust and noise evaluation, gas detection, safe and unsafe practices, accident reduction, emergency aid for the injured, mine rescue operations, safety duties of mine personnel, and instructor training and certification by the Mine Safety and Health Administration.



- 7662 Coal Mine Supervision** 5  
Introduces coal mine management and supervisory duties. Examines motivation, employee relations, and management by objectives.
- 7663 Water Drainage and Water Pollution Laws** 5  
Studies laws and problems pertaining to the control of water in mining operations. Covers slurry ponds, pit drainage, and acid seepage, with emphasis on federal EPA regulations.
- 7709 Basic Drilling Fundamentals** 5  
Instructs in the use of the drill press. Includes terminology, safety, plain drilling, tapping, reaming, countersinking, and counterboring. Also introduces inspection tools, including thread and drill gauges and depth mics.
- 7710 Machine Tool Introduction** 3  
Studies machine tool processes and the care and use of hand tools and measuring devices. Emphasis on basic drawing, print reading, and lab safety features.
- 7711 Fundamentals of Machining** 3  
Develops bench work, sawing, filing, layout, drilling, and reaming skills in the completion of student projects. Offers experience in communications and applied mathematics.
- 7712 Machining Fundamentals** 3  
Introduces use of lathes, milling machines, shapers, and drill presses through project assignments.
- 7713 Machining Fundamentals Practicum** 1  
Provides extensive practice and skill development in the use and operation of lathes, milling machines, and drill presses.
- 7714 Basic Drilling Operations** 5  
Introduces drilling setups and operations, including workholding devices, speeds, feeds, thread tops, and tapping techniques.
- 7715 Basic Milling Operations** 5  
Introduces milling machinery operations, focusing on speeds and feeds for both vertical and horizontal machines. Includes use of workholding fixtures and bandsaws, blueprint reading, precision measurement, and safety precautions.
- 7716 Production Machining I** 5  
Introduces production machining fixtures and processes and basic production gauging.
- 7720 Machine Tool Processing** 3  
Studies fundamental machine shop techniques, including threads and threading, sine bar applications, and dividing or indexing head.

- 7721 Machine Tool Setup and Operation** **3**  
 Studies completed, hardened, and ground V-block internal and external threads; also use of the dividing head.
- 7722 Machine Tool Processes—Practicum** **1**  
 Offers extensive practice and skill development in machine shop fundamentals, including threading, sine bar applications, and dividing heads.
- 7723 Machine Tool Setup—Practicum** **1**  
 Offers extensive practice and skill development in machine shop operations, including completion of hardened and ground V-blocks, internal and external threading, and use of the dividing head.
- 7724 Basic Grinding Operations** **5**  
 Introduces surface grinding applications and skills. Projects include machining to precision tolerances and surface finishes.
- 7730 Advanced Machine Tool Processing** **3**  
 Introduces grinding procedures and operations.
- 7731 Basic Print Reading** **3**  
 Instructs in the reading of machine shop symbols, stock lists, and shop blueprints with regard to dimension, shape, fabrication, and assembly. Applies basic mathematics in the solution of print and performance problems.
- 7732 Advanced Machine Tool Processing—Practicum** **1**  
 Offers extensive study in nontraditional machining, such as H.E.R.F., Laser, E.D.M., and E.C.M.
- 7733 Advanced Machine Tool Setup and Operation** **3**  
 Continues tool processing, surface and cylindrical grinding, and applied mathematics.
- 7734 Advanced Print Reading** **3**  
 Applies mathematics in solving shop problems related to die design and fabrication, special machinery, and die casting. Covers assembly, interpretation of drawings, and sketching without shop instruments.
- 7735 Advanced Machine Tool Setup—Practicum** **1**  
 Offers extensive extended practice and skill development in surface cylindrical grinding and related mathematics.
- 7736 Advanced Mill Operations** **5**  
 Introduces plunge, step, and angle milling operations and establishes dimensional tolerances. The student will machine a project which must function upon assembly.

- 7739 Basic Lathe Operations** **5**  
 Introduces engine lathe operations and systems. Demonstrates speeds and feeds, devices, dimensional tolerances, and finishes.
- 7740 Specialized Machining Theory** **3**  
 Introduces jig boring and grinding procedures, rotary table, tracing practices, and advanced machine tool processes in various areas. The student is assigned projects using specialized machine tools.
- 7741 Basic Metallurgy and Heat Treatment** **3**  
 Studies fundamentals of thermodynamics and reactions occurring in metals subjected to various kinds of heat treatment. Includes classification and properties of metals; chemical and physical metallurgy; theory of alloys; heat treatment principles as applied to ferrous and non-ferrous materials; tests to determine uses; heat treatment for steels, special steels and cast iron; powder metallurgy; use of gas and electric furnaces and their controls; applied mathematics; and communications skills.
- 7742 Specialized Machine Tool Application I** **3**  
 Applies jig boring and grinding skills to advanced projects.
- 7743 Specialized Machine Tool Application II** **3**  
 Applies knowledge of differential indexing, gear cutting, cam milling, and tracer design to student projects.
- 7744 Machinery Handbook I** **3**  
 Studies the intent and use of the Machinery Handbook.
- 7745 Machinery Handbook II** **3**  
 Applies principles and concepts contained in the Machinery Handbook to projects in the machine tool program.
- 7747 Advanced Lathe Operations** **5**  
 Demonstrates machining a thread on the lathe, working with tapers machined by various methods, and the operation of a turret lathe.
- 7748 Specialized Machine Tool Applications II—Practicum** **1**  
 Supplements Specialized Machine Tool Application II (7743).
- 7750 Tool Fabrication I** **3**  
 Studies tool design, assembly, and standards, with emphasis on the components and operations pertaining to blanking and piercing dies.
- 7751 Tool Fabrication II** **3**  
 Concentrates on progressive dies and the transfer of motion and force. Assigned projects aid the student in developing fabrication and designing skills.

**7752 Mechanism Design I****3**

Studies mechanical movements and mechanisms. Attention given to the complexity and feasibility of incorporating different kinds of movements into working mechanisms.

**7753 Mechanism Design II****3**

The student will complete a working drawing of a mechanism from a sketch, using accepted drafting standards and practices.

**7754 Tool Fabrication I—Practicum****1**

Supplements Tool Fabrication (7750)

**7756 Tool Fabrication III****3**

Demonstrates use of precision fits and alignment of mating parts in the construction of a working mechanism. The student will assemble a mechanism to perform a designated function.

**7758 Numerical Control and Automatic Processing I****3**

Introduces the concept of automatic process control and the fundamentals of feedback elements, transmission, control action, and controlling elements as used in pneumatic, hydraulic, and electrical systems. Emphasis placed on the relationship between digital devices and automatic process control systems.

**7759 Numerical Control and Automatic Processing II****3**

A continuation of Numerical Control and Automatic Processing I (7758)

**7760 Numerical Control and Automatic Processing III****3**

Introduces computer-aided numerical control programming, using 16 vocabulary usages and their results. Demonstrates preparation of a manuscript for a numerical control program. Explains cutter location computer file data and how it is used.

**7761 Plastics Molding and Die Casting Fundamentals****3**

Studies the materials and processes used in plastics and die casting, including mold and die tools, plastic and die casting composition, basic injection mold and die cast design, and machines and methods used to produce specific products. Emphasis on injection molding and die casting methods.

**7762 Precision Measurement****3**

Demonstrates techniques of linear and angular measurement, methods of application, and uses of precision measurements in machine tool production and quality control.

**7763 Grinding Technology I****3**

Develops proficiency in industrial grinding, including contour and radius grinding. Covers identification of abrasives and the structure, care, and use of grinding wheels.

- 7764 Layout and Inspection** 3  
Studies layout materials and instruments, with attention to interchange ability and inspection procedures.
- 7765 Grinding Technology II** 3  
A continuation of Grinding Technology I (7763).
- 7769 Numerical Control and Automatic Processing IV** 3  
A continuation of Numerical Control and Automatic Processing III (7760).
- 7772 Advanced Grinding Operations** 5  
Studies production grinding, including ID and OD grinding, surface grinding, and cut-off operations. Also studies surface finishes and the mounting, balancing, and dressing of various types of grinding wheels.
- 7775 Jig and Fixture Concepts and Design** 4  
Presents skills used in production machining. Includes mechanical drafting, blueprint-reading, and mechanical drawing.
- 7780 Basic Machine Tool** 6  
Introduces machine tool processes, the care and use of hand tools, and measuring devices, with emphasis on basic drawing, print-reading, and laboratory safety.
- 7781 Machine Fundamentals and Tool Processing** 6  
Introduces lathes, milling machines, and drill presses. Studies machine shop fundamentals, including threads and threading, sine bar applications, and dividing head and sketches.
- 7782 Advanced Machine Tool Processing—Setup and Operation** 6  
Covers procedures and operations pertaining to surface and cylindrical grinding.
- 7801 Introduction to Plastics** 3  
Introduces the plastic extrusion process, including the extruder, cooling, sizing, and cutting equipment, and numerous sizing techniques required for producing various plastic products.
- 7802 Plastic Extrusion** 3  
Develops skills in tool and machine setup and parts production, using plastic extrusion processes involving various materials.
- 7803 Plastic Injection Molding** 3  
Introduces the injection molding process, including mold setup, material handling, drying, job setup, and production of usable parts.

**7804 Plastic Materials****3**

Covers the properties, peculiarities, and applications of commercial polymers. Includes identification techniques and testing methods.

**7805 Low Pressure Tooling—Prerequisite: 7801 or department approval****3**

Trains the student to identify, evaluate, select, and use materials employed in low pressure tool making. Attention given to jigs and fixtures and cast, sheet metal, and aluminum tools. Coursework includes construction of a production mold, using one of several processes—wood, plaster, plastic, or rubber tooling—covered in the course. The tool built in the course will be used for molding parts in other plastics courses.

**7806 Thermoplastic Processes—General****3**

Covers blow molding, thermoforming, and casting. Students will produce parts from several materials using all three processes.

**7807 Plastic Quality Control****3**

Includes testing of incoming polymers, reading piece part blueprints, and controlling outgoing quality. Also covers sampling, confidence levels, and statistical methods used by the federal government and automotive companies.

**7808 High Pressure Tooling****3**

Covers preventive maintenance of tools, assembly and disassembly, interlocks, gate-sizing, and other aspects of high pressure tooling under the control of production personnel.

**7913 Introduction to Environmental Control****4**

Surveys the problems of pollution pertaining to water, air, population, solid waste, radiation, and noise. Examines man's impact on the environment and the global dilemma confronting all mankind.

**7915 Applied Chemistry I****3**

Provides laboratory training in various types of chemical analysis used in water testing to comply with state and federal wastewater effluent standards.

**7916 Environmental Seminar****1**

Develops environmental awareness through intensive monitoring of all communications media. Includes presentation of papers and group discussions.

**7926 Applied Chemistry II****3**

Consists of intensive laboratory training in the various types of chemical analysis used in water testing to comply with state and federal water quality standards. Includes study of theory and laboratory techniques for determining alkalinity, hardness, turbidity, and acidity, and levels of nitrates, ammonia, phosphates, grease and oil, cyanide, and phenols.

**7934 Basic Hydraulics—Prerequisite: 8204****4**

Presents engineering fundamentals pertaining to water supply and distribution,

wastewater collection, and removal and disposal. Introduces study of closed conduit and open channel flow, stream flow, runoff, and characteristics of pumps.

### **7942 Applied Microbiology 3**

Provides laboratory training in applied water and wastewater microbiology and the microbiology of milk and food. Includes total and fecal coliform, total plate count, and milk and food inspection.

### **7943 Water Supply and Treatment—Prerequisite: 7926 4**

Studies principles and methods of water purification, including coagulation, sedimentation, chlorination, treatment chemicals, taste and odor control, bacteriological control, mineral control design criteria, and maintenance and operational programs. Covers new processes and recent developments.

### **7945 Equipment and Maintenance I 3**

Presents fundamentals of electricity and electronics, the use and maintenance of laboratory equipment, instrumentation, and electrical systems and motors, with emphasis on troubleshooting and safety.

### **7946 Applied Research I 2**

The student researches an area of special interest within the field of air or water pollution.

### **7951 Reporting and Purchasing 2**

Studies recordkeeping, reporting, and purchasing practices relevant to efficient operation of an air or water pollution control facility.

### **7952 Management and Supervision Procedures 4**

Covers employee development and the responsibilities of supervision. Studies supervision and management within an organized structure. Attention given to communications, motivation, delegation of authority, interviews, and evaluation of employee performance.

### **7953 Wastewater Treatment—Municipal and Industrial 3**

Introduces methods of wastewater treatment. Emphasis on the importance of water pollution control in the environment.

### **7954 Plant Operations I—Municipal—Prerequisites: 7926, 7934 4**

Considers aspects of design, operation, and maintenance of wastewater treatment plants from an engineering viewpoint. Studies design parameters for all processes, materials used and their purposes, types and operation of equipment, maintenance of plant and equipment, and solutions to common operational problems.

### **7957 Community Sanitation 3**

Introduces public health protection and promotion of human comfort and well-being through control of the environment. Covers communicable diseases, solid wastes disposal, milk and food sanitation, disinfectants and insecticides, insect vector and rodent control, institutional sanitation, and occupational health.

**7960 Air Pollution Control I—Prerequisites: 7926, 7942****4**

Studies fundamentals of air pollution control, including history and effects of air pollution, air pollutants and their sources, meteorology and air pollution, concepts of thermodynamics, air quality criteria, particulates, sulfur oxides, nitrogen oxides, hydrocarbons, photochemical oxidants, process types, industries and agencies, and the applicability of federal, state, and local regulations, inspection, and enforcement.

**7961 Plant Operations II—Municipal****3**

Provides advanced study of wastewater treatment processes, with emphasis on ammonia and phosphorus removal, carbon absorption, filtration, disinfection, and coagulation.

**7963 Plant Operations III—Industrial****3**

Studies the special problems of industrial wastewater treatment, with emphasis on the major classifications of liquid industrial wastes. Includes neutralization, equalization, proportioning, and removal of troublesome solids. Also discusses cyanide and chromium treatment.

**7964 Plant Mathematics—Prerequisite: 8204****4**

Addresses problems concerning wastewater processing and process control. Includes laboratory and efficiency calculations, with special emphasis on mathematical skills and treatment plant calculations.

**7965 Wastewater Treatment Operator Training****4**

Studies principles and methods, new processes, recent developments, criteria, rules and regulations, and forms and records pertaining to water purification. Emphasizes engineering aspects of the design, operation, and maintenance of wastewater treatment plants.

**7966 Hazardous Materials****2**

Studies explosive, combustible, corrosive, toxic, and radioactive substances in contemporary life. Examines the chemistry of new and dangerous products.

**7967 Occupational Orientation****2**

Introduces students to career opportunities in environmental fields through guest lectures, films, and media surveys. Heightens consciousness of environmental problems and issues through discussion and active involvement.

**7968 Maintenance of Collection Systems****4**

Studies methods and purposes of operation, maintenance, inspection, testing, cleaning, and repair of the sewer collection system. Special attention given to the operation and maintenance of lift stations, and to safety and administrative record control.

**7969 Secondary Treatment Process Controls****3**

Studies in detail the controls and tests necessary for efficient operation in activated sludge, trickling filter, and other secondary wastewater processes.



- 7972 Environmental Administration** **4**  
 Studies decision-making structures of the private sector and of federal, state, and local governments with reference to environmental issues. Introduces fundamentals of environmental law.
- 7975 Basic Laboratory Skills** **2**  
 Offers training and experience in the identification, care, and use of laboratory equipment and glassware, laboratory safety, sampling techniques, solutions and dilutions, ordering of supplies and equipment, and inventory maintenance.
- 8001 Gas Welding I** **3**  
 Offers instruction in oxyacetylene welding, including gas welding techniques, brazing, and flame cutting.
- 8002 Gas Fusion and Brazing Shop** **3**  
 Offers practice in oxyacetylene welding processes in all positions. Includes exercises in brazing and cutting.
- 8003 Gas Welding II** **3**  
 A continuation of Gas Welding I (8001).
- 8005 Gas Welding I—Practicum** **1**  
 Offers practical experience in welding techniques.
- 8006 Basic Metallurgy** **3**  
 Studies properties and uses of ferrous and non-ferrous metals and alloys, production of iron and steel, composition and properties of plain carbon steel and alloying elements, selection of tools, case hardening, and destructive and nondestructive testing. Includes fundamentals of heat treatment and reactions occurring in metals subjected to various heat treatment methods and techniques.
- 8007 Basic Metallurgical Shop—Prerequisite: 8006** **2**  
 Provides hands-on experience in the use of various equipment for destructive and nondestructive testing. Also covers heat treating principles and procedures as related to welding applications.
- 8008 Gas Welding III** **2**  
 A continuation of Gas Welding II (8003).
- 8009 Gas Welding II—Practicum** **1**  
 Provides opportunities for skill development in oxyacetylene welding.
- 8010 Arc Welding I** **3**  
 Demonstrates the welding of ferrous metals and alloys using shielded metal arc methods, single and multipass techniques, and flat and horizontal positions. Emphasis on safe practices.

- 8011 Arc Welding Shop I** **3**  
Provides practice in welding in flat and horizontal positions on mild steel, using various electrodes.
- 8012 Arc Welding I—Practicum** **1**  
Provides directed practice in basic and advanced welding techniques.
- 8013 Blueprint Interpretation I** **3**  
Studies interpretation of blueprints pertaining to the welding trade. Attention given to metal structures, specifications and assembly drawings, special forms of dimensioning, and section views.
- 8015 Arc Welding III** **2**  
A continuation of Arc Welding II (8014). Introduces welding in the vertical up and down positions.
- 8016 Arc Welding IV** **3**  
Studies welding of ferrous metals and alloys using electric arc methods, single and multipass techniques, and vertical and overhead welding positions.
- 8017 Arc Welding V** **2**  
Continues Arc Welding IV (8016).
- 8019 Arc Welding II—Practicum** **1**  
Offers directed practice in welding, with emphasis on vertical and overhead positions.
- 8021 Arc Welding II—Shop** **3**  
Includes practice in advanced welding techniques, including vertical and overhead positions, single and multipass welds, and use of various types and sizes of electrodes.
- 8022 Electrical Fundamentals** **3**  
Studies the relationships of voltage, current, and resistance in electrical circuits, with emphasis on the production of heat from flow of current through resistance. Special attention given to the use of high-current transistors in AC circuits.
- 8023 Arc Welding VI** **2**  
Develops arc welding skills, with special emphasis on overhead positions and special metals.
- 8024 Blueprint Interpretation II** **3**  
Presents advanced study of blueprint interpretation, focusing on welding symbols and their significance in the welding trade. Includes process and finish symbols and methods of finish.

- 8027 MIG I** **3**  
 Studies various gas metal arc welding (GMAW) processes, including microwire, flux core, innershield, and submerged arc, in all welding positions.
- 8028 TIG I** **3**  
 Provides practice in using the GMAW processes. The student will learn to make welds on various thicknesses and types of metals in all welding positions.
- 8029 MIG II** **2**  
 Provides extensive welding practice using the metal inert gas welding (MIG) process. The student will make welds on various thicknesses of metal and in all welding positions
- 8032 MIG Lab** **2**  
 Offers extensive welding practice using the gas metal arc welding process. Students will make welds on various thicknesses and types of metal, using all welding positions.
- 8033 TIG Lab** **2**  
 Offers extensive welding practice using the gas tungsten arc welding process. Students will make welds on various thicknesses and types of metal, using all welding positions.
- 8034 TIG II** **2**  
 Provides extensive welding practice using the gas tungsten arc welding process. The student will learn to make welds on various types and thicknesses of metal using all welding positions.
- 8035 Basic Fabrication I** **3**  
 Presents principles of layout and measurement pertaining to the fabrication of metal products. Discusses tolerances, fits, and allowances.
- 8036 Basic Fabrication II** **2**  
 Students will construct individual projects using metal and other materials.
- 8037 Basic Mine Welding I** **3**  
 Studies welding techniques and materials used in the mining industry, including welding with low hydrogen electrodes and flux-cored wire. Prepares the student for preemployment testing as administered at mining operations and on coal mine construction projects.
- 8038 Basic Mine Welding II** **2**  
 Introduces all four welding positions and use of low hydrogen electrodes. Also introduces the flux-cored metal inert gas welding wire used in mining operations.

**8039 Arc Welding IV—Practicum****1**

Offers extended practice and skill development in the more advanced positions of arc welding.

**8040 Welding Equipment Maintenance (Oxyacetylene and Arc)****3**

Studies theory of operation and construction of oxyacetylene and arc equipment. Discusses maintenance and troubleshooting of welding equipment.

**8041 Welding Equipment Maintenance Shop—Oxyacetylene and Arc****1**

Offers hands-on experience in the maintenance and repair of oxyacetylene and arc welding equipment, including hoses and cables. Demonstrates the installation of replaceable working parts of oxyacetylene and electric arc welding equipment.

**8042 Basic Fabrication—Class****1**

Presents principles of layout and measurement pertaining to the fabrication of metal products. Discusses tolerances, fits, and allowances.

**8043 Basic Fabrication—Shop****2**

Students will construct individual projects using metal and other materials.

**8044 Welding Equipment Maintenance—Inert Gas****3**

Covers various welding processes, particularly tungsten inert gas and metal inert gas welding, with emphasis on welding techniques in all positions.

**8048 Occupational Safety and Health Act (OSHA) for Welding****3**

Studies the Occupational Safety and Health Act of 1970, with special attention to employer and employee rights and responsibilities, compliance with rules or standards, inspections by Compliance Safety and Health Officers, violations, citations, penalties, variances, appeals, record-keeping, and state and federal safety and health programs.

**8049 Production and Resistance Welding—Class****3**

Studies in depth the use of gas and arc welding in manufacturing and repetitive production operations. Emphasis on pipe welding and resistance techniques.

**8050 Production and Resistance Welding—Shop****2**

Covers the welding of pipe in fixed horizontal and vertical positions; and resistance, spot, and projection welding on various thicknesses and types of materials.

**8051 Welding Certification I****3**

Prepares the student for certification as a welder through study of the qualifications, procedures, and equipment standards. Includes a survey of agencies, associations and societies

**8052 Welding Certification II—Prerequisites: 8011, 8021, 8032, 8033****2**

Includes actual welding qualification practices in shielded metal arc, TIG and MIG welding

- 8053 Basic Pipe Welding I** **3**  
 Presents welding of pipe by means of the SMAW process, welding techniques in all positions, and use of various electronics, joint design, and fitup.
- 8054 Basic Pipe Welding II** **2**  
 Covers pipe welding, including multipass welding, in all positions.
- 8055 Special Welding Processes** **4**  
 Offers advanced study of welding methods, processes, techniques, machines, and equipment.
- 8057 Plasma—Arc Lab** **1**  
 Introduces plasma—arc welding in flat and horizontal positions.
- 8058 Industrial Materials** **4**  
 Studies internal and external forces resulting in deformation of elastic bodies. Includes analysis of simple and combined stresses relative to the functioning properties of materials. Includes laboratory experiments to determine the strength, hardness, and durability of common industrial materials.
- 8059 Welding Troubleshooting** **3**  
 Concentrates on the evaluation of weldments, welding procedures and tolerances, and joint design and alignment.
- 8060 Welding Troubleshooting Inspection Shop** **1**  
 Provides hands-on experience in visual destructive and nondestructive testing of weldments. Includes review of welding techniques.
- 8061 Pipe Welding I** **5**  
 Presents techniques of welding pipe in horizontal, flat, vertical up, and overhead positions with S.M.S.W. process. Includes electrodes, joint design, and fit-up.
- 8063 Electrical Fundamentals for Welding** **3**  
 Studies the relationships of voltage, current, and resistance in electrical circuits, with emphasis on the production of heat from flow of current through resistance. Special attention given to the use of high-current transistors in AC circuits.
- 8064 Basic Metallurgy** **3**  
 Studies properties and uses of ferrous and nonferrous metals and alloys, production of iron and steel, composition and properties of plain carbon steel and alloying elements, selection of tools, case hardening, and destructive and nondestructive testing. Includes fundamentals of heat treatment and reactions occurring in metals subjected to various heat treatment methods and techniques.
- 8065 Pipe Welding II** **5**  
 A continuation of Pipe Welding I (8061).

- 8066 Introductory Welding (Non-Majors) 3**  
Covers gas and arc applications for occasional users from other trade areas.
- 8067 Welding Codes and Testing Operations 3**  
Studies types of welding codes, testing operations, and procedure specifications. Attention given to filler metals, positions, preheat, heat treatment, back strips, preparation of base materials, cleaning, and defects.
- 8068 Specifications and Estimating—Prerequisites: 8201, 8202 2**  
Offers instruction and experience in metal specifications and estimating. The student will prepare an estimate for a job, based on calculation of time and materials.
- 8069 Metal Art—Prerequisites: 8001, 8002, 8010 1**  
Studies fabrication procedures for metal art designs and projects.
- 8074 Shop Practices 4**  
Presents the design, construction, theory of operation, diagnosis, troubleshooting, and maintenance of oxyacetylene gas and arc welding equipment. Emphasis placed on the operation of gas metal arc (MIG) and gas tungsten arc (TIG) equipment.
- 8075 Welding Fabrication I 2**  
Presents principles of layout, measurement, and joint designs used in the fabrication of steel and aluminum products. Students will construct individual and/or group projects, giving attention to tolerances and fitup of metal products. Emphasis on safe welding practices.
- 8076 Welding Fabrication II 2**  
Offers advanced study of layouts, measurements, and joint designs used in the fabrication of steel and aluminum products. Students will construct advanced individual and/or group projects using tolerances and fit up of metal products. Emphasis on safety procedures in fabrication.
- 8078 Gas Welding IV 2**  
A continuation of Gas Welding III (8008).
- 8079 Arc Welding VII 2**  
Presents advanced arc welding, with emphasis on use and orientation of submerged arc welding equipment.
- 8084 Arc Welding II—Practicum 1**  
Provides extended practice and skill development in arc welding.
- 8085 MIG III 3**  
Covers the phase of MIG Welding in the vertical plane in mild steel plates up to 3/4", using the multipass groove and fillet welds.

- 8086 TIG III** **3**  
Provides experience in welding heavy gauge aluminum in vertical up and vertical down positions. Introduces welding of light and heavy gauge aluminum.
- 8090 Shielded Metal Arc Welding I** **5**  
Covers welding in ferrous metals and alloys using shielded metal arc welding methods, including techniques in flat positions and horizontal, single-pass and multipass techniques; also covers safety hazards and safe practices in arc welding.
- 8095 Shielded Metal Arc Welding II** **5**  
Demonstrates the welding of ferrous metals and alloys using shielded metal arc methods, single- and multipass techniques, and flat and horizontal positions. Emphasis on safe practices.
- 8096 Gas Metal Arc (MIG) Welding** **5**  
Studies various gas metal arc welding (GMAW) processes, including microwire, flux core, innershield, and submerged arc, with emphasis on metal inert gas welding. Demonstrates techniques of welding in all positions on various thicknesses of metal.
- 8097 Gas Tungsten Arc (TIG) Welding** **5**  
Provides extensive practice in gas tungsten arc welding. Demonstrates welds on various types and thicknesses of metal, using all welding positions.
- 8098 Welding Certification** **4**  
Prepares the student for certification in shielded arc, TIG, and MIG welding through study of the qualifications, procedures, and equipment standards. Includes a survey of qualifying agencies, associations and societies.
- 8099 Oxyacetylene Welding and Cutting** **5**  
Offers basic instruction in oxyacetylene welding, with emphasis on welding techniques in flat, horizontal, vertical, and overhead positions. Also includes brazing and flame cutting. Attention given to safety hazards and safe practices in oxyacetylene welding and cutting.

## GENERAL EDUCATION

- 8109 Practical English** **4**  
Offers instruction and practice in the use of oral and written English as used in the world of business.
- 8110 Communications** **4**  
Helps the student to achieve competence in listening, speaking, reading, and writing. Emphasis is placed on writing skills.
- 8111 Business Communications—Prerequisite: Communications (8110)** **4**  
Develops communications skills for use in business and industry. Special atten-

tion is given to business correspondence and to problems in oral and written communication.

### **8113 Oral Communications 4**

Focuses on oral communication process as it applies to the workplace. Special attention is given to informative briefings, persuasive presentations, interviews, small conferences, and other job-related communication situations.

### **8114 Technical Reporting—Prerequisite: 8110 3**

Presents principles and methods of written and oral reporting. Includes preparation of various types of reports, business letters, and memoranda.

### **8116 Speed Reading 2**

Increases reading speed while maintaining or improving comprehension. Demonstrates how to match reading speeds with objectives and types of material.

### **8117 Effective Listening 2**

Focuses on the process of listening. Discusses barriers to effective listening and provides exercises to overcome them.

### **8118 Effective Reading 2**

Increases reading speed while maintaining or improving comprehension and retention. Analyzes the student's present reading ability and demonstrates techniques for achieving greater efficiency and effectiveness.

### **8119 Copywriting—Prerequisite: 8110 or 8112 4**

Studies techniques of effective copywriting as applied to magazine and newspaper advertising, including outdoor, transit, and direct response. Covers preparation of headlines and body copy and scripting for television and radio commercials. Also studies aspects of language relating to behavioral sciences.

### **8120 College Study Principles 2**

Helps the student to acquire successful study habits and to deal more effectively with college-level lectures and laboratory work.

### **8123 Total Communications—Manual I 4**

Studies the use of the manual alphabet and the expressive and receptive skills, body language, and facial and grammatic expressions needed for communication with the deaf. Attention is given to the psychology of deafness.

### **8127 Vocational Technical Vocabulary for the Deaf I 4**

Provides the deaf student with a basic or core technical vocabulary for the study program of his/her choice.

### **8128 Technical Vocabulary for the Deaf II 4**

A continuation of Technical Vocabulary for the Deaf I (8127), with emphasis on meanings and signs.



<b>8129 Technical Vocabulary for the Deaf III</b>	<b>4</b>
A continuation of Technical Vocabulary for the Deaf II (8128).	
<b>8130 Technical Vocabulary for the Deaf IV</b>	<b>4</b>
Covers technical terms associated with advanced course work.	
<b>8131 Total Communications Manual II</b>	<b>4</b>
A continuation of Total Communications—Manual I (8123).	
<b>8132 Effective Communication (for the hearing impaired)</b>	<b>4</b>
Offers solutions to various communication problems encountered by the deaf in job-seeking and on-the-job situations. Provides practice in interpersonal communications, information sharing, and persuasive argument.	
<b>8135 Total Communications—Manual III</b>	<b>4</b>
A continuation of Total Communications—II (8131). Provides further instruction in expressive, receptive, conversational, and presentational skills.	
<b>8136 Business Terminology for the Deaf</b>	<b>3</b>
Studies business terminology relating to the student's area of interest. Develops skills in the use of business terminology.	
<b>8137 Structure of the English Language (for the hearing impaired)</b>	<b>4</b>
Establishes a foundation for successive communication courses.	
<b>8150 Spelling</b>	<b>1</b>
Offers study and practice in spelling, with attention to rules and exceptions.	
<b>8151 Developmental Writing (Pre-Tech)</b>	<b>3-4</b>
Offers training in basic writing skills. Emphasis is placed on sentence structure and basic grammar.	
<b>8152 Developmental Reading I (Pre-Tech)</b>	<b>2-4</b>
Develops decoding, vocabulary, and comprehension skills. Aids in developing basic reading skills to junior high school level.	
<b>8153 Developmental Reading II (Pre-Tech)</b>	<b>2-4</b>
Develops vocabulary and comprehension to high school level.	
<b>8154 Developmental Reading III (Pre-Tech)</b>	<b>2-4</b>
Develops vocabulary and comprehension to college level.	
<b>8155 Intrapersonal Skills Development (Pre-Tech)</b>	<b>4</b>
Offers strategies for improving the self-image, with emphasis placed on the student's strengths. Encourages increased self-direction.	

- 8156 Study Skills Development (Pre-Tech)** **2**  
 Develops skills needed for success in classroom work. Includes note-taking from lectures, textbook reading, outlining, and test-taking.
- 8157 Communications Skills Development** **3**  
 Develops vocabulary, grammar, and writing skills relevant to the student's chosen occupation.
- 8158 GED Writing Skills Test Preparation** **4**  
 Prepares the student for Writing Skills Test I of the five-part GED test series.
- 8159 Improving Your Handwriting** **2**  
 Improves the student's ability to write legibly. Includes individual diagnosis of penmanship faults, demonstration of handwriting techniques, and guided practice.
- 8160 Developmental Writing II** **4**  
 Demonstrates how to apply the rules of grammar to written sentences and how to expand from single sentences to groups of sentences based upon a central idea.
- 8161 English as a Second Language** **3**  
 Develops English language skills and technical vocabulary relevant to the student's field of study. Course designed for students whose first language is not English.
- 8162 Spelling** **2**  
 Offers study and practice in spelling, with attention to rules and exceptions.
- 8163 Learning Development I** **4**  
 Offers comprehensive testing and diagnosis of the student's learning strengths and weaknesses. Provides intensive developmental training in basic learning skills.
- 8164 English as a Second Language - Level I** **4**  
 Offers oral/aural exercises and drills in phrases and sentence structure for students who have had little exposure to English.
- 8165 English as a Second Language - Level II** **4**  
 Offers oral/aural exercises and drills in conjunction with elementary reading and writing exercises. Course is designed for students who have had little exposure to English.
- 8166 English as a Second Language - Level III** **4**  
 Offers practice in speaking and writing English. Course designed for students who have some understanding of English.
- 8167 Language Skills Development** **4**  
 Provides an intensive, highly individualized program in the perceptual and cognitive development necessary for growth in language skills.

**8168 Language Skills 4**

Studies spelling, punctuation, word division, capitalization, number and abbreviation styles. Develops automatic responses for office efficiency.

**8170 Developmental Speech I 4**

Develops basic communication skills.

**8201 Applied Mathematics I 4**

Reviews basic mathematics required for technical fields, with emphasis on measurement, ratio, proportion, percentage, and formula evaluation.

**8202 Applied Mathematics II 4**

Continues study of basic mathematics, with emphasis on equations, squares, square roots, distances, areas, volumes, and right triangles.

**8203 Technical Mathematics I 4**

Introduces algebra through linear equations in one unknown. Includes graphing, powers of ten, scientific notation, and the metric system.

**8204 Technical Mathematics II 4**

A continuation of Technical Mathematics I (8203), with emphasis on systems of equations, factoring, fractional and quadratic equations, and logarithms.

**8205 Technical Mathematics III 2**

Continues study of equations using determinants and matrices. Introduces computer number bases and Boolean algebra.

**8206 Technical Calculus I 4**

Introduces analytic geometry and differential and integral calculus.

**8208 Geometry—Prerequisite: 8203 3**

Studies geometric topics relevant to modern technology, including fundamentals of geometry, polygons, solid geometry, properties of circles, constructions, and right triangles.

**8209 Trigonometry—Prerequisite: 8203 3**

Studies trigonometric functions, use of trigonometric tables and scientific calculators, problems involving right triangles, oblique triangle trigonometry, and graphing of trigonometric functions.

**8210 Statistics—Prerequisite: 8203 3**

Studies the collection, interpretation, and presentation of data, including measures of central tendency, binomial and normal distributions, hypothesis-testing, and probability.

- 8211 Computer Mathematics** **2**  
 Studies mathematics relevant to solution and simplification of computer programs, including number bases, logic, and flowcharts.
- 8212 Business Mathematics** **4**  
 Studies business practices of banking and retail sales, including reconciliation statements, invoicing, simple interest, payroll, and inventory. Introduces metrics and number bases other than ten.
- 8213 Mathematics of Finance—Prerequisite: 8212** **4**  
 Studies topics of interest to the business manager, including markup, commission, taxes, and compound interest. Introduces statistics, depreciation, and analysis of financial statements.
- 8214 Metric System** **1**  
 Introduces the use of metrics, with emphasis on everyday applications.
- 8216 Commercial Art Mathematics** **2**  
 Includes measurement, scaling, and mathematics pertaining to type specification and space requirements in newspaper, magazine, and TV advertising.
- 8218 Mathematics of Finance II—Prerequisite: 8213** **4**  
 A continuation of Mathematics of Finance I (8213).
- 8220 Metrics** **3**  
 Explains the metric units commonly used by business and industry and compares the metric and English systems. Demonstrates use of conversion tables to change from one system to the other.
- 8222 Trigonometry II** **3**  
 Provides extensive application of Trigonometry to practical problems in technology.
- 8223 Pre-Mathematics for Electronics I** **4**  
 Studies arithmetic operations of whole numbers, fractions, decimals, and their applications to electronics.
- 8224 Pre-Mathematics for Electronics II** **4**  
 Studies percentage, ratios, proportion, signed numbers, scientific notation, and their applications to electronics.
- 8225 Pre-Mathematics for Electronics III** **4**  
 Studies elementary algebra and its application to electronics.

<b>8226 Technical Mathematics III</b>	<b>4</b>
Continues study of equations, using determinants and matrices. Introduces computer number bases and Boolean algebra.	
<b>8227 Computer Math Logic</b>	<b>4</b>
Studies arithmetic operations in binary, octal, and hexadecimal numeration systems and conversion from the decimal system.	
<b>8251 Arithmetic I (Pre-Tech)</b>	<b>2</b>
Studies arithmetic operations in whole numbers.	
<b>8252 Arithmetic II (Pre-Tech)</b>	<b>2</b>
Studies arithmetic operations in fractions.	
<b>8253 Arithmetic III (Pre-Tech)</b>	<b>2</b>
Studies arithmetic operations in decimals.	
<b>8254 Intermediate Arithmetic I (Pre-Tech)</b>	<b>2</b>
Studies percentage and its uses.	
<b>8255 Intermediate Arithmetic II (Pre-Tech)</b>	<b>2</b>
Studies ratios and proportions.	
<b>8256 Intermediate Arithmetic III (Pre-Tech)</b>	<b>2</b>
Studies measurement, including English and metric.	
<b>8257 Elementary Algebra (Pre-Tech)</b>	<b>2</b>
Introduces algebraic concepts, including signed numbers, expressions and terms, simple equations, and formulas.	
<b>8258 Elementary Geometry (Pre-Tech)</b>	<b>2</b>
Introduces concepts of plane and solid geometry.	
<b>8259 Elementary Trigonometry (Pre-Tech)</b>	<b>2</b>
Introduces plane trigonometry concepts, with emphasis on right triangle trigonometry.	
<b>8260 Occupational Mathematics I (Pre-Tech)</b>	<b>2</b>
Studies mathematics related to the student's occupational area.	
<b>8263 Developmental Mathematics I</b>	<b>2</b>
Covers whole numbers, fractions, and decimals.	
<b>8264 Developmental Mathematics II</b>	<b>2</b>
Covers percentage, ratio and proportion, and the metric system.	

**8265 Mathematics Concepts****3**

Covers pre-algebraic concepts pertaining to numbering systems and operations in addition and subtraction, using fractions and decimals.

**8266 Mathematical Skills****4**

A continuation of Mathematics Concepts (8265).

**8267 Mathematics for Business I****4**

Applies fundamentals of business mathematics to banking transactions and retail and wholesale sales. Covers interest, discounts, credit charges, commissions, and metric measurements.

**8268 Mathematics for Business II****4**

Continues study of business mathematics, emphasizing markup, payroll records, compound interest, depreciation, and financial statements.

**8271 Elementary Algebra****3**

Prepares students who have had no algebra or who need review for entry into Technical Mathematics I (8203).

**8272 Mathematics Skills Development****4**

Follows the student's individualized education plan (IEP) in the development of pre-math and basic math skills.

**8273 Basic Mathematics Review****3**

Develops elementary mathematics skills at the student's pace in preparation for more advanced study. Includes review of whole numbers, fractions, and decimals.

**8274 Ratio, Proportion, and Measurement****2**

Presents the numerical relationships expressed in ratios and proportions and their use in converting units of measure from English to metric or metric to English systems. Emphasis is placed on the use of formulas and the meanings of metric prefixes.

**8301 Physical Science****3**

Studies the sources and transformations of energy and the effects of the use of energy on the environment and human population.

**8302 Mechanics—Prerequisite: 8209****3**

Studies the stability, movement, construction, and effectiveness of machines and mechanisms.

**8303 Heat, Light and Sound—Prerequisite: 8203****3**

Studies the technological use of heat, light, and sound as forms of energy. Emphasis placed on the transfer of energy, the production of heat, and electromagnetic radiation.

- 8307 General Chemistry** **3**  
 Studies the forms and reactions of matter, concepts of atomic structure, bonding, equilibrium, acid-base chemistry, solutions, and chemical calculations. Also introduces principles of organic chemistry and biochemistry.
- 8308 General Microbiology** **3**  
 Introduces fundamentals of microbiology, with emphasis on types of microorganisms, their nutrition and metabolism, and their beneficial and harmful effects on man.
- 8351 Science Development in Chemistry (Pre-Tech)** **1**  
 Studies chemistry concepts in a self-paced format in preparation for a technical curriculum.
- 8353 GED Science I** **3**  
 Studies concepts of physics, chemistry, and biology in a self-paced format in preparation for a technical curriculum.
- 8401 Human Relations** **4**  
 Studies human behavior, motivation, relationships, and human aspects of the workplace, emphasizing applications and personal awareness.
- 8402 Applied Behavioral Psychology** **4**  
 Helps students discover and actualize unique capacities and personal strengths in themselves and others. Emphasis on discovering, clarifying, and affirming the individual potential for living more fully.
- 8403 Psychology of Advertising** **4**  
 Studies principles of psychology relevant to advertising, consumer behavior, life styles, design and color concepts, motivation, consumer self-image, and roles.
- 8404 Environmental Psychology** **4**  
 Studies psychological concepts pertaining to the design of space and objects for human work, living, and leisure.
- 8406 Employment Orientation** **2**  
 Investigates employment opportunities in the student's area of interest. Discusses interviews, occupational information and sources, and specific jobs and fields.
- 8410 Social Development** **3**  
 Aids in the development of social skills related to employment, job training, and job seeking.
- 8414 Career Exploration** **2**  
 Investigates career options based on the student's values, interests, and abilities. Provides a foundation for making a career choice.

- 8417 Sociology** 4  
Introduces definitions, theories, and concepts developed by sociologists to explain group behavior, structures, and processes.
- 8418 Making It Count** 3  
Introduces computers through a telecourse.
- 8421 Developmental Psychology/ Life Cycle Development** 3  
Introduces study of social, emotional, and mental development. Includes theories of achievement and adjustment.
- 8422 Principles of Sociology** 3  
Studies the structure and dynamics of the social organization of modern society. Focuses on social institutions and issues and the causes and consequences of human social behavior.
- 8451 Introduction to the World of Work** 2  
Examines the mental and social adjustments and educational and vocational preparation necessary for success in the job market.
- 8452 Abnormal Psychology—Prerequisite: Human Relations (8401)** 4  
Deals with biological, psychological, and sociocultural aspects of maladaptive behavior. Discusses clinical definitions, therapeutic intervention, assessment techniques, and prevention of maladaptive behavior patterns. Includes study of transient stress reactions, neurotic patterns, physical illness related to psychological factors, personality disorders, schizophrenia, paranoia, and behavioral disorders of childhood and adolescence.



# OTHER COURSES

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**8425 Contemporary Health Issues****3**

Explores contemporary issues in American health through interviews with health care experts and lay persons. Topics include the status of health in America, the meaning of health in a changing environment, current health hazards, self-inflicted disease, and acquiring and using health knowledge.

**8501 Field Study/Cooperative Education****1-15**

Provides opportunity for a field project or research case study within the student's occupational specialty. The project or study will include collection and analysis of data and actual work experience in business or industry.

**8551 Tutorial Assistance Laboratory****1-15**

Offers opportunity for extended practice in skills specifically related to one or more courses.

**9305 Technical Mathematics for Health Occupations****5**

Offers a basic course in technical mathematics, including review of arithmetic, basic concepts of algebra, graphing geometry, and logarithms, for students in health occupations.

**9306 Health Careers Mathematics****3-5**

Presents fundamentals of mathematics, including arithmetic, exponents, directed numbers, arithmetic operations using scientific notation, Roman numerals, metric conversions, apothecaries and household systems of measurement, centigrade and Fahrenheit conversions, simple equations, and the construction and interpretation of graphs, in preparation for subsequent courses in the health occupations.

**9307 Health Careers Biology I 2**

Introduces fundamental concepts of biology, including organization, cell structure, and respiratory processes.

**9308 Health Careers Biology II 2**

Introduces concepts of biology pertaining to cellular control mechanisms, with emphasis on processes of protein synthesis, gene control, development, differentiation, reproduction, basic genetics, and cybernetic systems.

**9310 Pharmacology 4**

Discusses commonly used medications and their effects on the body. Emphasis placed on clarification, uses, routes of administration, dosages, interactions, incompatibilities, and side effects. Attention given to special precautions, legal aspects, and patient education.

**9311 Mathematics for Pharmacology 2**

Presents principles of computation as used in the administration of drugs.

**9312 Health Careers Chemistry 3**

Introduces in a 4-week module the basics of chemistry, including atomic and molecular concepts and a description of solutions by different means, such as percent by weight. Also includes equilibrium systems, with emphasis on acids and bases, and buffer systems.

**9315 Nurse Aide Procedures and Practicum I 6**

Trains nurses' aides and orderlies to perform specific duties under the direct supervision of the professional nurse. Covers care of the patient unit, personal care of the patient, vital signs, admission procedures, nutrition and patient safety, nursing in specific disease conditions, employment practices and procedures, and clinical experience.

**9322 Biophysics for the Health Occupations 2**

Studies basic concepts of physics and their applications in the health field. Emphasis placed on problem solving and practical applications of theoretical material.

**9324 Arts and Practices for Nurse Aide/Orderlies 6**

Prepares nurses' aides and orderlies to become members of the medical team at health care institutions. Emphasis placed on development of professional attitudes and skills.

**9326 Health Careers Chemistry Laboratory 1**

Develops the laboratory competencies needed for pre-program entry level in the health occupations.

**9327 Nurse Aide Procedures 6**

Trains nurses' aides and orderlies to perform specific duties under the direct supervision of the professional nurse. Covers care of the patient unit, personal care of

the patient, vital signs, admission procedures, nutrition and patient safety, nursing in specific disease conditions, employment practices and procedures, and clinical experience.

- 9328 Nurse Aide and Orderly** **9**  
 Prepares nurses aides and orderlies to become members of the medical team at health care institutions. Emphasis placed on development of professional attitudes and skills.
- 9330 Survey of Anatomy and Physiology** **2**  
 Studies the human body as an integrated unit. Includes anatomy; physiology; medical terminology; applications of physics, chemistry and microbiology; and common diseases.
- 9331 Medical Terminology for Nurse Aide** **2**  
 Includes nomenclature pertaining to nursing procedures, diagnosis, diseases and their causes, abnormalities, injuries, surgical procedures, hospital departments, equipment, and titles of health care personnel.
- 9332 Mathematics for Nurse Aide** **5**  
 Presents fundamentals of mathematics as applied to health care.
- 9333 Pharmacology and Medication Administration for Unlicensed Personnel** **5**  
 Provides training for nurses aides employed in nursing homes in the safe administration of oral drugs. Also includes study of common diseases.
- 9336 Pharmacology I** **2**  
 Studies methods of administering drugs, correct dosages, symptoms of overdose, and abnormal reactions arising from individual differences in patients.
- 9337 Pharmacology II** **2**  
 Continues Pharmacology I (9336).
- 9338 Unit Clerk Medical Records** **4**  
 Instructs in the duties of the unit clerk, emphasizing the maintenance of patient records. Explains the uses and purposes of medical charts and demonstrates the preparation and maintenance of a chart during a patient's hospitalization. Attention given also to the legal responsibilities of the unit clerk.
- 9342 Advanced Pharmacology for the QMA** **1**  
 Offers continuing education for the qualified medication aide (QMA), with emphasis on the administration of medication to the elderly.
- 9349 Anatomy and Physiology** **8**  
 Studies the human body as an integrated unit. Includes anatomy; physiology; medical terminology; applications of physics, chemistry and microbiology; and common diseases.

**9350 Medical Law and Ethics****2**

Studies the ethics of medicine and medical practice, with attention to the legal requirements and implications for professional and subprofessional medical practices and personnel.

**9352 Physiology****4**

Studies the nervous, muscular, cardiovascular, respiratory, digestive, urinary, endocrine, and reproductive systems and their functions with regard to the body as a whole.

**9353 Anatomy and Physiology I****4**

Studies the human body as an integrated unit. Introduces anatomy; physiology; medical terminology; applications of physics, chemistry and microbiology; and common diseases.

**9354 Anatomy and Physiology II****4**

A continuation of Anatomy and Physiology I (9353).

**9355 Medical Terminology****2**

Presents basic terminology required of all paraprofessionals in the health occupations. Also includes terminology specific to the student's area of specialization.

**9356 Disease Conditions I****3**

Presents basic concepts concerning disease, its causes, and the resulting changes in body functions. Emphasis placed on functional disturbances and the correlation of patient symptoms with emergency and in-patient treatment.

**9357 Advanced Medical Terminology****4**

Offers advanced study of medical terminology, including derivatives and applications of medical terms, symbols and signs, diseases, conditions, and treatments.

**9358 Pharmacology****3**

Introduces the basic principles of pharmacology. Studies classifications of drugs, dosages, interactions, and incompatibilities. Covers drug administration, weights and measurements, and methods of preparation, with attention to legal aspects and special precautions.

**9359 Cardiopulmonary Resuscitation****1**

Develops proficiency in mouth-to-mouth, mouth-to-nose, and mouth-to-stoma breathing.

**9365 Chemical Dependency****4**

Introduces studies of chemical dependency, including commonly abused drugs, effects and symptoms of withdrawal, and treatment alternatives.

- 9375 Refresher Medicine for OMAs** 1
- A review course for qualified medication aides who wish to renew their credentials.
- 9411 Mechanical Drawing I** 3
- Introduces fundamentals of drafting, including interpretation of lines, view positions, conventions and standard signs, symbols and abbreviations, use of instruments, simple geometric constructions, orthographic projections, scaling, and dimensioning.
- 9412 Shop Mathematics** 3
- Reviews addition, subtraction, multiplication, and division of whole and mixed numbers, fractions, decimals and percentages. Emphasis on application to industrial shop problems.
- 9413 Building Trades Blueprint Reading 1** 3
- Studies the interpretation of signs, symbols, dimensions, and abbreviations used in construction blueprints.
- 9414 Blueprint Reading I** 3
- Studies the interpretation of working drawings and application of the blueprint information to the working part. Includes study of views, details, dimensions, signs, and symbols.
- 9416 Basic Diemaking I** 4
- Introduces details, techniques, and theory of stamping dies. Provides training in various types of cutting and forming operations.
- 9417 Advanced Diemaking I** 4
- A continuation of Basic Diemaking I and II (9416 and 9425). Includes progressive compound and inverted dies, die-to-press relationships, and automatic feeds.
- 9418 Industrial Electrical Blueprint Reading** 3
- Studies the interpretation of working schematics and blueprints pertaining to control circuits and industrial feed circuits commonly used in industrial machinery.
- 9419 Basic Molding** 4
- Studies the composition and characteristics of various plastic materials, compression factors, transfer and injection molds and their components, heating and cooling principles, and applications.
- 9421 Shop Mathematics II** 3
- Covers linear and square measure, volumes, square roots, ratios and proportions, and an introduction to algebraic functions, sine numbers, grouping, and axioms. Emphasis on practical application to shop problems.

**9423 Blueprint Reading II 3**

Studies more complicated blueprints for mechanical parts, machines, and tools. Emphasis on relationship of print to the working piece.

**9425 Basic Diemaking II 4**

Studies primary die components, including punches, punch plates, die blocks and strippers, and their functions.

**9426 Advanced Diemaking II 4**

Demonstrates the making of more elaborate and complicated dies. Includes study of dieforms, draw dies, secondary operations, trim, notch, and shear dies.

**9428 Machine Operator Shop Mathematics I 3**

Studies common and large fractions as used by the machine operator.

**9429 Machine Operator Shop Mathematics II 3**

Studies decimal fractions as used especially in micrometer measurement.

**9431 Shop Mathematics III 3**

Covers addition, subtraction, multiplication, and division of monomials and polynomials, equations, factoring, fractions, fractional and literal equations, exponents and radicals, linear equations, and quadratics.

**9432 Blueprint Reading III 3**

Studies the reading of electrical blueprints and schematics, with attention to signs, symbols, and abbreviations.

**9441 Shop Mathematics IV 3**

Studies geometrical terms, axioms, and theorems and propositions dealing with straight lines, triangles, and circles. Emphasis on practical applications to shop problems.

**9460 Mathematics VI 3**

Studies obliques using the altitude construction method; laws of sines, cosines, and cotangents;  $<$  angle formula; and tangent law. Emphasis on application to shop design problems.

**9470 Review of Preapprenticeship 3**

Reviews the basic skills needed for entry level apprenticeship training.

**9475 Introduction to Robotics 4**

Studies the differences between pararobots and robots; the uses and functions of robots; the relationships of robotics to hydraulics, pneumatics, and electronics; and factors affecting robotic systems. Also covers robotics maintenance, control devices, microprocessor operation, data acquisition systems, and basic data handline and conversion system.

**9476 Advanced Robotics****4**

A continuation of Introduction to Robotics (9475).

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